

AMBIENT AIR SURVEY
IN THE
'JUNCTION TRIANGLE'
AREA - TORONTO
July - August 1980

ARB-TDA REPORT No. 59-80

TD
883 7
.06
A432
1980



Ministry
of the
Environment

RESTRICTED DISTRIBUTION
FOR INTERNAL USE ONLY

AIR RESOURCES BRANCH
Technology Development and Appraisal Section
Monitoring and Instrumentation Development Unit

ARB - TDA Report No. 59-80

Ambient Air Survey in the
"Junction Triangle" Area - Toronto

July - August, 1980

Ontario Ministry of
the Environment
880 Bay Street,
Toronto, Ontario

November 1980

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact Service Ontario Publications at copyright@ontario.ca

TABLE OF CONTENTS

	<u>Page</u>
01. Summary	3
02. Introduction	8
03. Source Description	9
04. Survey Technique	12
05. Monitoring Technique	13
06. Monitoring Site Locations	17
07. Results	22
08. Discussion	24
09. Appendix	50

01 Summary

During the third and fourth weeks of July, 1980, as requested by the Central Region of the Ministry of the Environment, the Monitoring and Instrumentation Development Unit of the Air Resources Branch conducted an ambient air survey in Toronto in the Junction Triangle area. The main purpose of this survey was to assess the peak concentrations of specific hydrocarbons in the vicinity of Glidden Paint Company Ltd, Anchor Cap and Closure Corporation of Canada Ltd, National Starches Nacan Products Ltd and the Junction Triangle area as a whole.

Very warm, humid and unstable air pushed northward from the south central United States into Ontario during this survey. Showers and thunderstorm activity were common; however, considerable low-level atmospheric stability was established through nocturnal cooling.

Ground level concentration (glc) data for ozone (O_3) and total hydrocarbons (THC) were acquired on a continuous basis by the Mobile Air Monitoring (MAM) Unit and 166 instantaneous ambient air samples were acquired and subsequently analyzed for a variety of hydrocarbons by a gas chromatograph contained in the MAM unit during this survey.

From the 37 monitoring periods comprising this survey, approximately 54 hours of continuously monitored THC data were acquired. Significant glc's of THC were recorded. The overall average THC glc was 4.10 ppm (parts per million) with associated standard deviation 1.20 ppm. The non-methane components were the more dominant species with their overall average glc being 2.64 ppm and associated standard deviation 1.02 ppm. The methane component overall average glc was 1.12 ppm.

The largest maximum one-hour average glc of THC was 7.47 ppm and was detected in the vicinity of Glidden Paint Co. Ltd. The largest maximum one-hour average THC glc detected in the vicinity of Anchor Cap was 6.95 ppm.

Low glc's of ozone (O_3) were detected during this survey. From the 54 hours of acquired data, the overall average glc for O_3 was 0.025 ppm with associated standard deviation 0.013 ppm. At no time was the desirable Ambient Air Quality Criterion for ozone (i.e. 0.08 ppm) exceeded during this survey.

Analyses of ambient air samples for peak concentrations of specific hydrocarbons were requested by the Ministry of Labour. These analyses were performed by a gas chromatograph (GC). It must be stressed that these readings cannot be directly compared to the established Ambient Air Quality Criteria or Guidelines, which are based on specific time intervals (usually 1 hour, 8 hour or 24 hour), during which period the concentrations of the components of the ambient air sample must be continuously integrated/averaged. However in the absence of any other concentration reference or benchmark, the respective Criterion or Guideline will be mentioned in the discussion of the specific hydrocarbons.

The field procedure dictated that the sampling for the specific hydrocarbons by the GC would take place only when the continuous monitoring THC instrument showed a peak HC response/concentration. Therefore all the GC results are biased towards the high concentrations. For example, if the average concentration of the instantaneous analyses taken over the appropriate time interval (for example; the average of 5 readings taken over 1 hour duration) is equal or less than the respective Criterion or Guideline, then the average concentration taken on a continuous basis would be with all probability less than that Criterion or Guideline. This is the only comparison that can be made with respect to the Ambient Air Quality.

Sixty-six ambient air samples were acquired in the vicinity of Glidden Paint. From the subsequent analyses, the geometric mean glc of 1,2,4-trimethyl benzene was 40 ug/m^3 with the maximum being 231 ug/m^3 . Seven of the 66 samples resulted in 1,2,4-trimethyl benzene glc's in excess of 100 ug/m^3 . Similarly the geometric mean glc of 1,3,5-trimethyl benzene was 11 ug/m^3 with the maximum being 109 ug/m^3 . Only one of the 66 samples depicted 1,3,5-trimethyl benzene glc's in excess of 100 ug/m^3 . Other significant maxima and mean glc's were; total xylenes- 1700 ug/m^3 and 196 ug/m^3 ; ethyl benzene - 374 ug/m^3 and 35 ug/m^3 ; toluene- 992 ug/m^3 and 150 ug/m^3 ; methyl ethyl ketone (MEK)- 513 ug/m^3 and 51 ug/m^3 . The maxima glc's of decane and isophorone were 480 ug/m^3 and 676 ug/m^3 respectively. (Only 3 or 4 samples were analyzed for these latter two hydrocarbons.)

Contaminants resulting from the combined emissions of many sources evolve into a uniform atmospheric loading and the geometric standard deviation of the acquired glc data usually lies in the range 1.85 to 2.4. For a single emission source, the geometric standard deviation would be higher. Thus the geometric standard deviation for xylenes (2.8), ethyl benzene (2.8), toluene (2.5), MEK (2.6) and the trimethyl benzenes (2.5) imply a discrete source in this area. In addition, the correlation analyses between the glc's of toluene and m/p xylene (significant at the 95% confidence level) also implies a mutual source for these two contaminants.

Sixty-three ambient air samples were acquired in the vicinity of Anchor Cap and Closure Corporation of Canada Ltd. From the subsequent G.C. analyses, the geometric mean glc of 1,2,4-trimethylbenzene was 81 ug/m^3 with the maximum being 516 ug/m^3 . Twenty-one of the 63 ambient air samples contained glc's of 1,2,4-trimethyl benzene in excess of 100 ug/m^3 . Similarly the geometric mean glc of 1,3,5-trimethyl benzene was 18 ug/m^3 with a maximum 207 ug/m^3 . Three of the 63 samples depicted 1,3,5-trimethyl benzene glc's in excess of 100 ug/m^3 . Other significant maxima and geometric mean glc's detected in these 63 samples were; total xylenes - 384 ug/m^3 and 69 ug/m^3 ; ethyl benzene - 71 ug/m^3 and 12 ug/m^3 ; methyl ethyl ketone - 86 ug/m^3 and 36 ug/m^3 ; toluene - 174 ug/m^3

and 36 ug/m^3 and methyl butyl ketone- 289 ug/m^3 and 9 ug/m^3 . Correlation analyses between the trimethyl benzenes and methyl butyl ketone suggested a mutual origin; all statistics being significant at the 99.9% confidence level. Similarly the geometric standard deviation for 1,2,4-trimethyl benzene (2.5), 1,3,5-trimethyl benzene (4) and methyl butyl ketone (3) implied a discrete source in this area.

In general, lower glc's of the aforementioned specific hydrocarbons were detected in the vicinity and directly downwind of National Starches - Nacan Ltd. From the subsequent analyses of the 16 ambient air samples, the more significant maxima and geometric mean glc's were; 1,2,4-trimethyl benzene - 53 ug/m^3 and 22 ug/m^3 ; 1,3,5-trimethyl benzene- 33 ug/m^3 and 6 ug/m^3 ; toluene- 225 ug/m^3 and 82 ug/m^3 ; methyl ethyl ketone- 738 ug/m^3 and 42 ug/m^3 and total xylenes - 180 ug/m^3 and 47 ug/m^3 . The toluene and methyl ethyl ketone glc's were the highest recorded during this entire survey.

During the last two days of this survey, the mobile air monitoring unit was positioned at several locations throughout the Junction Triangle area in order to assess the overall ambient air quality.

Low glc's of the aforementioned hydrocarbons were detected from the 21 ambient air samples comprising this segment of the survey. The following maximas and geometric mean glc's were monitored; 1,2,4-trimethyl benzene- 41 ug/m^3 and 17 ug/m^3 ; 1,3,5-trimethyl benzene- 16 ug/m^3 and 5 ug/m^3 ; xylenes- 145 ug/m^3 and 41 ug/m^3 and toluene - 153 ug/m^3 and 42 ug/m^3 .

From the aforementioned 166 ambient air samples analyzed by the gas chromatograph, benzene glc's were found to be essentially uniform throughout the

Junction Triangle area. The maximum benzene glc detected in the vicinity of Glidden Paint Company Ltd. was 70 ug/m^3 ; Anchor Cap and Closure Corporation of Canada Ltd. was 60 ug/m^3 ; National Starches-Nacan Ltd. was 85 ug/m^3 and the general ambient air survey was 92 ug/m^3 . The mobile air monitoring van was located directly downwind of a gas station when the 92 ug/m^3 of benzene were detected.

02. Introduction

As requested by the Central Region, the Monitoring and Instrumentation Development Unit of the Air Resources Branch conducted an ambient air survey in the "Junction Triangle" area of Toronto during the period of July 17 to August 1, 1980. The Junction Triangle is located in the west central part of Toronto and is bounded by Bloor St. on the south, Dundas St. on the west, Dupont on the north and Lansdowne Ave. on the east.

The main purpose of this ambient air survey was to provide peak readings on specific hydrocarbons, as ^{selected}~~determined~~ by the Ministry of Labour, in the vicinity of Anchor Cap and Closure Corporation of Canada Ltd., National Starches - Nacan Products Ltd. and the Glidden Paint Company.

03. Source Description

The area under investigation during this survey was the "Junction Triangle" in Toronto, with emphasis on the Anchor Cap and Closure Corporation of Canada Ltd., National Starches - Nacan Products Ltd., and the Glidden Paint Company.

Anchor Cap produces synthetic plastic materials with chemical processes using various resins and solvents. A large number of different hydrocarbons have been identified in the emissions from the lacquer, plastisol and lithograph ovens among the several emission points on the Anchor Cap property.

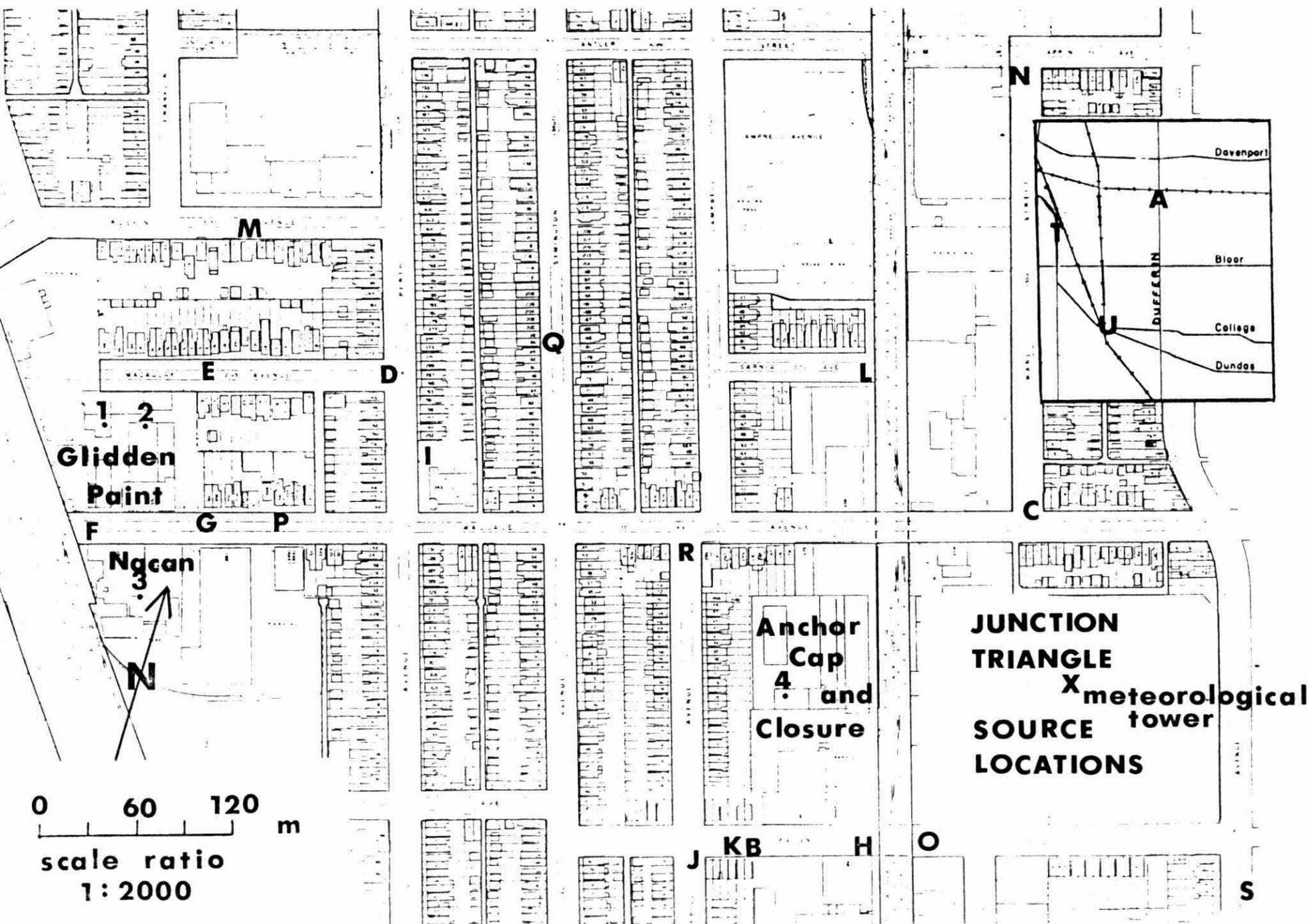
Nacan produces several glues, resins and solvents, and many different hydrocarbons have been identified from the emission points on the Nacan process buildings as well.

Glidden produces several paints, lacquers, varnishes and adhesives; again, several hydrocarbons have been identified from the emission points on the Glidden buildings. In addition, a tank farm on the Glidden property is a suspected source of several hydrocarbons.

The locations of these companies and their respective emission points are shown on Map #1, on page 10. The location of the meteorological tower used during the survey period is also included for the reader's convenience.

In addition, several photographs of the actual survey are presented.

MAP # 1



AMBIENT AIR MONITORING - JUNCTION TRIANGLE

CAMPBELL PARK
(Minisonde
Release)



NATIONAL STARCHES-
NACAN PRODUCTS LTD.
and
GLIDDEN PAINT
COMPANY LTD.

ANCHOR CAP AND
CLOSURE CORPORATION
OF CANADA LTD.



04. Survey Technique

Analytical instrumentation housed in a 1975 General Motors Corporation "Transmode" was utilized to monitor the requested contaminants in the "Junction Triangle" area in Toronto. This mobile air monitoring (MAM) unit was equipped with an automated data acquisition system (Hewlett Packard 9830A mini-computer) and on-board electric generators for fully automated, independent and continuous monitoring capabilities. The HP 9830A mini-computer performed initial data analyses in the field (re: accuracy & validity) whereas the final data reduction and analyses were carried out by a larger computer system located within the Air Resources Branch at 880 Bay Street, Toronto.

The MAM unit has permanently installed analyzers for monitoring sulphur dioxide, hydrogen sulphide, carbon monoxide, ozone, oxides of nitrogen, total hydrocarbons and methane; however, only the total hydrocarbons and ozone analyzers were operational continuously throughout the survey. Meteorological instrumentation for monitoring wind speed, wind direction, relative humidity, temperature, barometric pressure, and solar radiation and vertical wind/temperature profiles were also included in this instrumentation package. In addition, as requested by the Region, a gas chromatograph (GC) unit was set up for a more complete hydrocarbon analyses. See Table #1 on page 16, for a listing of the above instrumentation.

Following an assessment of wind direction and wind speed, suitable ambient air monitoring sites were chosen. Air quality was continuously monitored for at least 1½ hours at each site.

05. Monitoring Technique

Sample Collection

The ambient air samples were taken at a constant flow rate of approximately $0.2 \text{ m}^3/\text{min}$. by a probe located on top of the MAM unit whose orifice was located approximately 5 metres above ground level. Air samples entered a manifold from which each analyzer including the GC was parallel tapped with a minimal length of teflon sampling line. This arrangement ensured little or no sample degradation due to ground level sources (e.g. entrained soil, vehicular traffic, etc.).

Instrumentation - Analyzers

The instruments associated with the MAM unit are presented in Table #1 on page 16.

Instrumentation - GC and Hydrocarbon Sample Collection Methods

The analysis of hydrocarbons in ambient air was performed by a Hewlett-Packard Gas Chromatograph (HP 5840A) and a microprocessing unit (HP 18850A GC terminal). Operating parameters were monitored automatically by the microprocessing unit once the programme was entered.

G.C. Operating Conditions

column - capillary, fused silica 0.3 mm I.D., 50m long, carbowox 20M deactivated, coated with SP-1200

carrier gas - Helium, 4 ml/min (linear velocity 95cm/sec)

make-up gas - Nitrogen, 8ml/min

detector - Photoionization, 10.2 eV lamp, 150°C

sample volume - 5 ml sampling loop

temperature programming - 30°C-hold for 2 min, 30°C/min for 2 min, 20°C/min up to 170°C, hold for 2 min.

Ambient air hydrocarbon samples were extracted by the sampling loop and analyzed by the GC for the following hydrocarbons: methyl ethyl ketone (MEK), benzene, ethyl acrylate, methyl methacrylate, methyl butyl ketone (MBK), toluene, n-octane, ethyl benzene, m-xylene, cyclohexanone, o-xylene, nonane, iso propyl benzene, n-propyl benzene, 1,3,5-trimethyl benzene, 1,2,4-trimethyl benzene, decane, and isophorone.

The G.C. was calibrated by a sample of air with a known concentration of the above hydrocarbons.

Photoionization Detection (PID)

In addition to the THC analyzer associated with the MAM unit, qualitative assessment of the ambient air for THC was performed by a portable HNu photoionization detector. This detector was carried in a support van and was only used to locate HC plumes and to assess the status of several odour complaint episodes. If a significant concentration of HC was present during a complaint episode, the MAM unit would be called in for a more detailed investigation. However this latter procedure was not carried out due to

very low HC concentrations recorded by the PID analyzer during these complaint episodes.

Meteorological Analysis

Meteorological conditions were monitored on a continuous basis by the instrumentation in the MAM unit (refer to Table #1, page 16).

Calibration

Analyzers and sources were calibrated before the survey. During the survey, the calibration of the analyzers was checked at least once every day using calibrated sources and built in electronic circuitry. All monitors were found to be stable and calibration remained within the prescribed limits throughout the duration of the survey. Immediately following completion of the survey, all instruments were rechecked in the laboratory and all calibration statistics were found to be satisfactory.

Table #1

Table 1: INSTRUMENTATION - GMC

<u>Instrument</u>	<u>Manufacturer</u>	<u>Analytical Technique</u>	<u>Maximum Sensitivity (Full Scale)</u>
H ₂ S Source	Hartmann & Braun (H&BPrüfgasgenerator)	N/A	N/A
H ₂ S Analyzer	H&B Picos	electrochemical	0.05 ppm
SO ₂ Source	H&B Prüfgasgenerator	N/A	N/A
SO ₂ Analyzer	H&B Picoflux 2	conductometric	0.3 ppm
O ₃ Analyzer/Source	Bendix 8002	chemiluminescent	0.05 ppm
NO _x , NO ₂ , NO Analyzer	Bendix 8101-B	chemiluminescent	0.5 ppm
CO Analyzer	H&B Uras 2T	Infrared Absorption	50 ppm
THC, CH ₄ , THC-CH ₄ Analyzer	Ingenieur - Produktions-Gruppe München (IPM) RS-5	Dual flame ionization detector	50 ppm THC (as CH ₄)
Hg Analyzer	Scintrex HGP-2	Ultra-violet Absorption	200 ng/m ³
CO, THC, THC-CH ₄ , CH ₄ source	Matheson	compressed gas	N/A
Gas Chromatograph	HP 5840A		Set by Calibration Procedure

<u>Instrument</u>	<u>Manufacturer</u>	<u>Scale</u>
**Wind speed	Lambrecht gmbH	km/hr
**Wind Direction	Lambrecht gmbH	degrees
Temperature	Weather Measure (WM) T621	°C
Relative humidity	WM-HM-IIIP	percent
Barometric pressure	WM-BM70-B242	millibars
Solar radiation	WM Star Pyranometer	watts/cm ²
Minisonde Receiver	Aero Aqua Inc.	°C and km/hr.

** These wind indicators are located on top of a 10-metre retractable mast.

06. Monitoring Site Locations

Ambient air monitoring sites are indicated on Map #2, page 21 and the associated descriptions are presented in Table #2, pages 18 to 20.

The reference points used for the companies are indicated as follows on the map.

1. Glidden Paint Co. Ltd.
2. Glidden Paint Co. Ltd. Tank Farm
3. National Straches-Nacan Products Ltd.
4. Anchor Cap and Closure Corporation of Canada Ltd.

TABLE #2
Mobile Air Monitoring Sites

Site (X)	Map ID	Location	Distance (km)	Bearing (DEG)
1	A*	Galleria, Dupont & Dufferin/ General	--	--
2	B	75 m West of tracks on Paton Road/Anchor Cap	0.09	175
3	C	Ward St. & Wallace Ave./ Anchor Cap	0.19	040
4	D	Macaulay & Perth/Glidden Tank Farm	0.16	060
5	E	30 Macaulay/Glidden Tank Farm	0.06	030
6	F	W end of Wallace/Nacan & Glidden	--	--
7	G	360 Wallace Ave./Glidden Tank Farm	0.07	130
8	H	Paton Rd., just W of RR/ Anchor Cap	0.11	135
9	G	360 Wallace Ave./ Nacan	0.06	015
10	I	Perth Ave. United Church/ Nacan	0.19	045
11	G	Main Entrance to Glidden on Wallace/Glidden	0.09	120
12	H	Paton Rd., just W of RR/ Anchor Cap	0.11	135
13	B	115 Paton Road/Anchor Cap	0.09	175
14	J	Campbell at Paton/Anchor Cap	0.11	195
15	K	119 Paton Rd./Anchor Cap	0.10	185
16	F	Footbridge at W end of Wallace/ Glidden	0.06	170

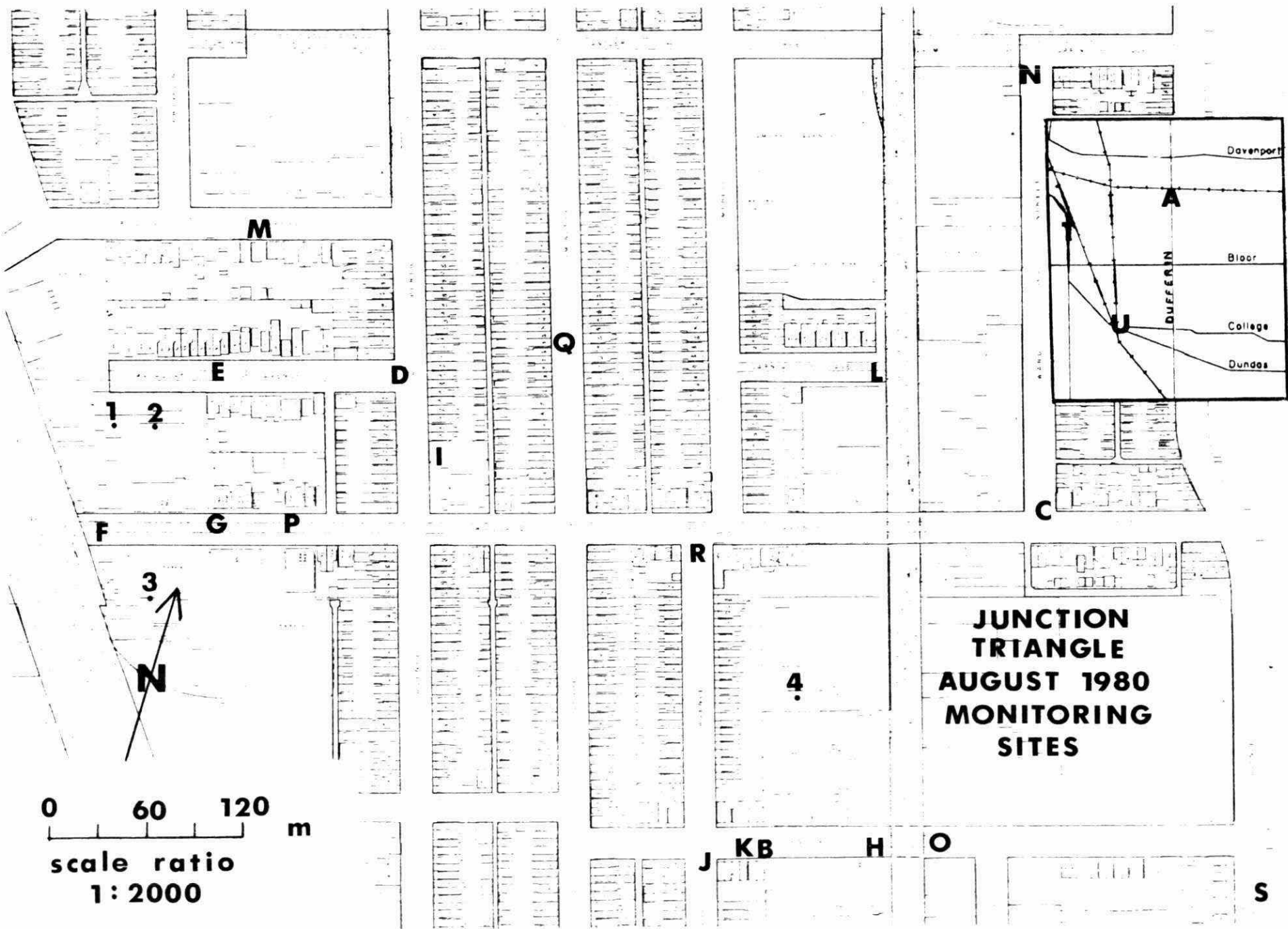
TABLE #2 (cont'd)

Site (X)	Map ID	Location	Distance (km)	Bearing (DEG)
17	H	Paton Rd., just W of RR/ Anchor Cap	0.11	135
18	L	Sarnia Ave., at RR tracks/ Anchor Cap	0.21	000
19	F	Footbridge at W end of Wallace/Glidden	0.06	170
20	M	21 Ruskin Ave./Glidden	0.15	020
21	C	Ward St. & Wallace Ave./ Anchor Cap	0.19	040
22	N	Lappin Ave. & Ward St./ Anchor Cap	0.42	005
23	F	Footbridge at W end of Wallace/ Glidden	0.06	170
24	F	Footbridge at W end of Wallace/ Glidden	0.06	170
25	O	Paton Rd., just E of RR/ Anchor Cap	0.12	120
26	H	Paton Road, just W of RR/ Anchor Cap	0.11	135
27	G	360 Wallace Ave./Glidden	0.09	120
28	P	346 Wallace Ave./Glidden	0.12	115
30	H	Paton Rd., just W of RR/ Anchor Cap	0.11	135
31	G	360 Wallace Ave./Glidden	0.09	120
32	G	360 Wallace Ave./Nacan & Glidden	--	--
33	Q	196 Symington/General (Anchor Cap)	0.26	310
34	R	301 Campbell/Anchor Cap	0.99	310
35	S	741 Lansdowne Ave./TTC Barns	--	--

TABLE #2 (Cont'd)

Site (x)	Map ID	Location	Distance (km)	Bearing (DEG)
36	T*	44 Chelsea at Dundas/General	--	--
37	U*	Dundas & College Sts. near gas station/General	--	--

* See inlay on Map #2, page 21.



07. RESULTS

Definition of Terms

Scan Time:	Frequency of interrogation of the monitoring instrumentation by the data acquisition system.
Time:	Time of the first and final scans used to determine running averages.
Number of Readings:	Number of scans
MAM:	Mobile Air Monitoring
glc:	ground level concentration

With respect to the continuous ambient air monitoring instrumentation associated with the MAM unit, all statistical values are based on cumulative averages of continuous instantaneous interrogations of the monitoring instruments and all results are expressed in parts per million (ppm). Due to the large quantity of this data, time averages will be included in the addendum entitled "Ambient Air Survey in the "Junction Triangle" Area - Toronto, July - August, 1980, compilation of Time Averaged Data", which will accompany this report and will be available upon request. Both 30 and 60 minute averages of the data will be presented in this addendum.

The statistical summary of the collected data is presented in Tables #10 to #13, pages 59 to 68. Supplementing these tables, concentration versus time graphs are presented in Figures # 1 to #7, pages 52 to 58.

In order to assist in source identification, wind rose/concentration analyses were also carried out (see Maps #3 and #4, pages 37 and 42).

TABLE #3

STATISTICAL PRINT-OUT

JUN.TRI #1

DATE: JUL 17 1980
 SCAN TIME: 90 SEC
 AVERAGING TIME: 60 MIN
 LOCATION: GALLERIA, DUPONT & DUFFERIN /GENERAL

TIME	THC SOLAR RAD WIND SPEED	THC-CH4 TEMP WIND DIRECTION	CH4 HUMIDITY	OZONE BAROMETER
10:23----11:23	2.1E+00 4.5E-02 14	1.2E+00 29 317	6.8E-01 69	5.4E-02 1003
10:53----11:53	2.1E+00 5.0E-02 14	1.2E+00 30 324	7.2E-01 64	5.5E-02 1003
11:23----12:23	2.0E+00 6.4E-02 16	1.2E+00 32 334	7.7E-01 56	4.2E-02 1004

STATISTICS

NUMBER OF READINGS 98

POLLUTANT	MINIMUM VALUE	MAXIMUM VALUE	ARITHMETIC MEAN	STANDARD DEVIATION	GEOMETRIC MEAN	GEOMETRIC STD. DEV.
THC	1.31E+00	3.82E+00	2.06E+00	2.99E-01	2.04E+00	1.14E+00
THC-CH4	7.20E-01	1.55E+00	1.18E+00	1.47E-01	1.17E+00	1.14E+00
CH4	3.44E-01	8.20E-01	7.30E-01	6.55E-02	7.26E-01	1.12E+00
OZONE	3.07E-02	4.06E-01	4.74E-02	4.45E-02	4.28E-02	1.37E+00
SOLAR RAD	1.00E-06	8.82E-02	5.58E-02	2.12E-02	4.67E-02	3.23E+00
TEMP	28	33	31	2		
HUMIDITY	45	77	62	8	61	1
BAROMETER	982	1004	1003	2	1003	1
WIND SPEED	7	28	15	4	15	1

MAXIMUM
AVERAGE

THC	2.12E+00
THC-CH4	1.23E+00
CH4	7.68E-01
OZONE	5.50E-02
SOLAR RAD	6.35E-02
TEMP	32
HUMIDITY	69
BAROMETER	1004
WIND SPEED	16
WIND DIRECTION	334

08. Discussion

During the third week of July, a persistent high pressure ridge over the central United States slowly moved northeastward resulting in a west to southwesterly flow over Ontario. The approach of this high pressure ridge brought warm, humid air from the southern States into Ontario. The atmosphere was unstable and consequently, shower and thunderstorm activity was common.

During the last week of July, the weather was dominated by a broad trough behind this ridge. A very warm, humid and unstable air mass just south of the United States border began to push northward triggering thunderstorm activity on several occasions.

Despite generally unstable atmospheric conditions, considerable low-level stability was established through nocturnal cooling.

A meteorological station was established at the Toronto Transit Commission garage on Paton Road and Lansdowne Avenue and was run continuously from July 14 to August 4. The wind frequency rose analyses (Rose #1 on page 29) clearly donates that the wind was predominantly from the NW and S directions (25% and 22% respectively) throughout this survey period.

With respect to wind dynamics in this area, the major railway lines running N/S adjacent to Anchor Cap and Glidden/Nacan induced slight channeling especially during windy conditions. In general, the urban environment of the Junction Triangle area induced only slight orographic modification and all monitoring was performed when wind velocities were less than 20 km/hr.

As mentioned in Section 04, Survey Technique, only the glc data for ozone and total hydrocarbons acquired on a continuous basis (for total of 66 hours) and the 166 instantaneous samples acquired by the gas chromatograph will be discussed in the ensuing discussion. The ozone and total hydrocarbon data will be treated as air quality data for the entire Junction Triangle area with averaged glc's based on 60 minutes whereas the instantaneous G.C. data will be discussed with reference to a particular suspected source.

It must be pointed out that during the 66 hours of ambient air monitoring, the MAM Unit essentially monitored worse-case conditions. As stipulated in the Ontario Environmental Protection Act, impingement zone monitoring was undertaken whenever and wherever feasible and upon locating these zones (by spatial/temporal scan with the analytical instruments, analyzing the prevailing wind/dynamics of the area, and by visual and olfactory discriminatory techniques), ambient air monitoring was conducted for a period of 1½ hours so as to ensure a true, representative 60-min average glc of the continuously monitored gaseous contaminant(s) was obtained.

Qualitative measurements for hydrocarbons by the Portable Photo-ionization detector (see section 05) also assisted in the determination of these impingement zones for high hydrocarbon glc's.

As will be noted in the statistical summary tables for O₃ and THC, the glcs' arithmetic mean and standard deviation are given. Since monitoring was undertaken for a period of at least 1½ hours during each one of the monitoring periods (MP), if the arithmetic mean depicted a glc in excess of the Criterion, then the Criterion must have been exceeded during the monitoring period.

These results do not truly relate the status of the air quality in this area since the monitor was not permanently placed but rather reflect the success of impingement zone monitoring.

Geometric analyses were applied to the specific, instantaneous hydrocarbon contaminants as analyzed by the G.C. Since it was assumed that these specific hydrocarbons were lognormally distributed, the geometric standard deviation would also lend some insight into source(s) delineations. If the geometric standard deviation was greater than 2, a discrete source was implied for that contaminant.

The instantaneous ambient air samples analyzed by the gas chromatograph were acquired only when the total hydrocarbon analyzer depicted a maxima. Thus these results were not randomly acquired (with respect to time or expected concentration) and would reflect maximum loadings in the Junction Triangle area.

Because of this biasing, if the average concentration of the instantaneous analyses taken over the appropriate time interval (for example; the average of 5 readings taken over 1 hour) was equal or less than the respective Criterion or Guideline, then the average concentration of that particular contaminant taken on a continuous basis would also be with all probability less than the respective Criterion or Guideline. Criterion and Guidelines require definite time intervals.

Since this is the only comparison that can be made between the instantaneous and continuous frames of reference in the discussion of the GC analyses and ambient air quality, the 30-min. Guidelines for the specific hydrocarbons will be referred to for comparisons only and will be stated as "benchmarks".

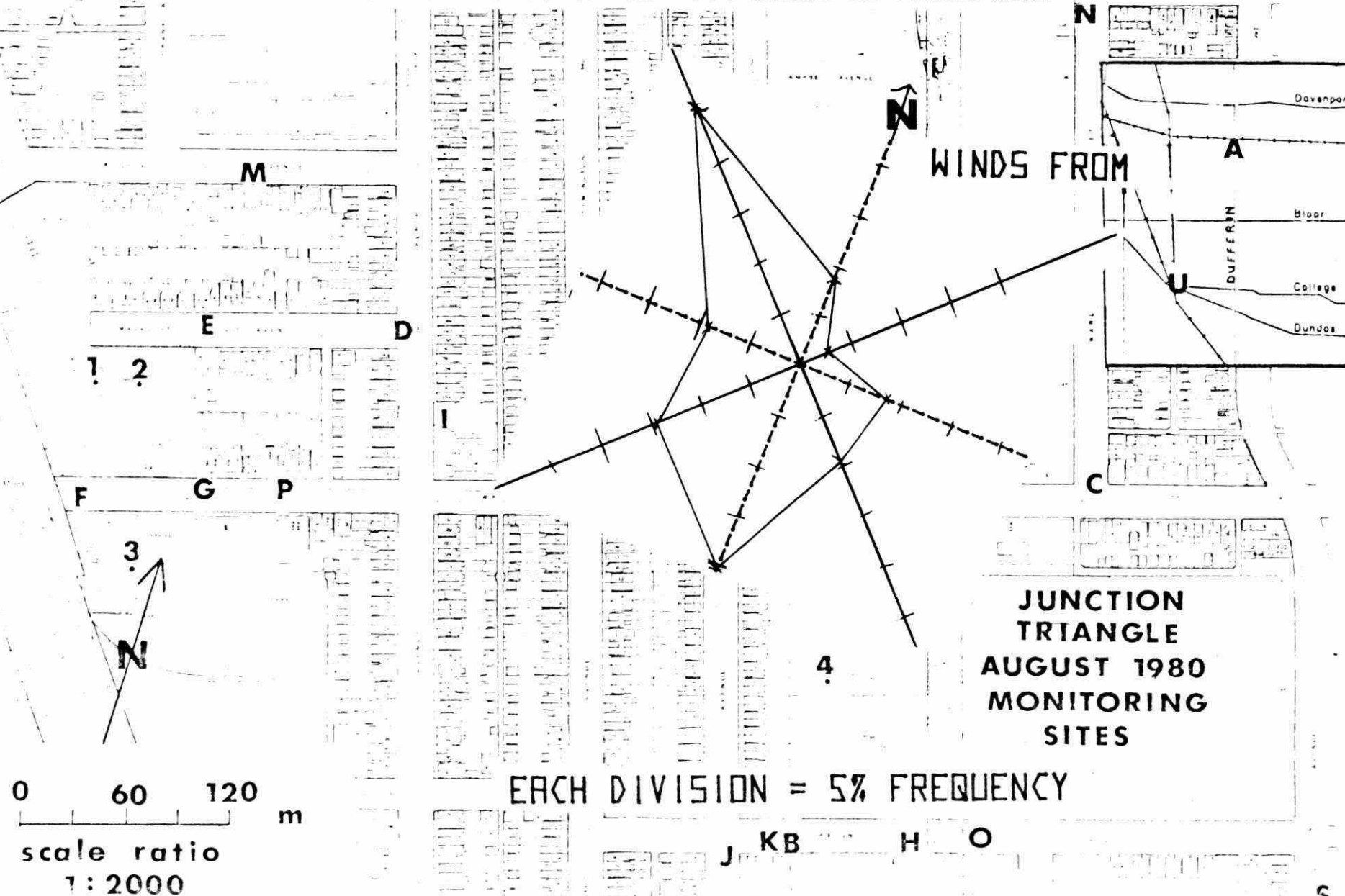
The following Table presents the establish 30-minute Guidelines, as monitored at the point of impingement and as set out by the Ministry of the Environment Regulations for the gaseous hydrocarbon contaminants monitored during this ambient air survey.

TABLE #4

<u>Contaminant</u>	<u>Guideline</u> (30 min Avg) ug/m ³
Methyl Ethyl Ketone (MEK)	31,000
Benzene	10,000
Ethyl Acrylate	4.5
Methyl Methacrylate	860
Toluene	2,000
Ethyl Benzene	4,000
Xylenes	2,300 (Total)
Iso-propyl Benzene	100
1,3,5 - Trimethyl benzene	100
1,2,4 - Trimethyl benzene	100
cyclo-hexanone	*
nonane	*
	Air Quality Criteria (1 hr Avg) ppm
Total Hydrocarbons	*
Ozone	0.08

* at present there is no Criteria nor Guidelines for the above contaminants

WIND DIRECTION ANALYSES
CONTINUOUS FROM JULY 14 1980 TO AUGUST 4 1980
MET. TOWER LOCATED AT THE TTC BARNES ON PATON ROAD



Total Hydrocarbon - THC

Approximately 54 hours of THC data were acquired during 22 monitoring periods. During this time, the overall average glc of THC was 4.10 ppm with an associated standard deviation 1.20 ppm. The non-methane component (THC-CH₄) showed an overall average glc of 2.64 ppm with an associated standard deviation of 1.02 ppm whereas, the overall average glc of the methane component (CH₄) was relatively low (1.12 ppm) (See statistical summary Tables #10 and 11 on pages 59 to 62.) The above figures suggested that a significant amount of THC was not of a biological origin but was being produced within or transported into the industrial area under investigation.

The maximum one-hour average glc of THC recorded was 7.47 ppm and was acquired on July 24 during monitoring period JUN.TRI #16 (See Graph #5, page 56.) During this time, the MAM unit was located downwind of Glidden as can be seen by the wind rose/concentration analysis Map #3, page 37. (N.B. This wind rose is a 30 minute average representation.)

High values of THC were also recorded downwind of Anchor Cap. During monitoring period JUN.TRI #26, the second highest one-hour average glc of THC was recorded at 6.95 ppm. (See Figure #7 on page 58.) The MAM unit was located adjacent to and downwind of Anchor Cap (See Map #4 on page 42.)

Ozone - O₃

Ozone was monitored during this survey since it is indicative of atmospheric photochemical reactions.

Approximately 54 hours of O₃ data were acquired during 22 monitoring periods. The overall average concentration for the survey period was 0.025 ppm with an associated standard deviation of 0.013 ppm. At no time did the one-hour average glc's of O₃ exceed the Ontario Air Quality Criterion of 0.08 ppm. (The analyzed data is presented in Table #11, pages 61 and 62.)

The highest maximum one-hour average glc recorded was 0.069 ppm and was acquired on July 21 during monitoring period JUN.TRI #5. The MAM unit was located at 30 MaCaulay Street and the winds were light with a northeasterly component. (See Graph #2, on page 53.)

Gas Chromatograph (GC) Analyses

During the survey, a GC unit was set up to monitor specific hydrocarbons. These included methyl ethyl ketone (MEK), benzene, ethyl acrylate, methyl methacrylate, methyl butyl ketone (MBK), toluene, n-octane, ethyl benzene, m-xylene, p-xylene, o-xylene, cyclohexanone, nonane, iso-propyl benzene, 1,3,5 -trimethyl benzene, 1,2,4 - trimethyl benzene, decane and isophorone. The results of the GC analyses are presented in Tables #14 to 17 on pages 69 to 81.

The G.C. analyses are classified according to the monitoring site location; i.e. downwind of Glidden, downwind of Anchor Cap, downwind of Nacan and general air quality of the Junction Triangle area.

From these analyses, it was found that glc's of benzene, ethyl acrylate, methyl methacrylate, n-octane, cyclo hexanone, nonane, iso propyl benzene and n-propyl benzene approached or were at background levels. Only a limited number of

analyses depicted significant glc's of isophorone and decane due to the inability to effectively resolve the chromatogram with respect to these compounds. A summary of the geometric analyses for the remainder of these aforementioned hydrocarbons are presented in Table #5 on page 33.

From this table and a comparison between the geometric mean of the specific hydrocarbon coupled with the general air quality, and the information inferred by the geometric standard deviation, the following general comments were evident. Significant glc's of MEK, toluene, ethyl benzene, total xylenes, 1,3,5-trimethyl benzene and 1,2,4-trimethyl benzene were detected in the vicinity of the Glidden Paint Company. In addition, significant glc's of MBK, nonane, cyclohexanone, 1,3,5-trimethyl benzene and 1,2,4-trimethyl benzene were monitored in the vicinity of Anchor Cap and significant glc's of MEK and toluene were found in the vicinity of Nacan.

NOTE: With respect to the xylenes, the meta (m) and para (p) isomers could not be effectively resolved on the chromatogram. Therefore, the meta concentration results also contain the para contribution. The Criterion and Guidelines for xylenes states total xylenes; i.e. no distinction is made with respect to the 3 xylene isomers.

TABLE #5
HYDROCARBON ANALYSIS
GEOMETRIC MEANS
(and geometric standard deviations)

Sample Location	# of Samples									Units
		MEK	MBK	Toluene	Ethyl Benzene	m&p-xylene	o-xylene	1,3,5-trimethyl benzene	1,2,4-trimethyl benzene	ug/m ³
Glidden	66	51 (2.6)	3	150 (2.5)	35 (2.8)	150 (2.5)	46 (3)	11 (2.8)	40 (2)	
Anchor Cap	63	36	9 (3)	36 (1.9)	12 (2.0)	46 (1.9)	23 (2.0)	18 (4)	81 (2.5)	
Nacan	16	42 (3.8)	ND	82 (1.7)	6	35	12	6	22	
General Air Quality	21	ND	ND	42	6	31	10	5	17	

ND - Not detected

i- Glidden Paint

Sixty-six ambient air samples were acquired in the vicinity of Glidden Paint and the subsequent analyses are summarized in Table #6 on page 38. Using as a benchmark, the concentrations as set out in Table #4 on page 28, only the instantaneous glc's of 1,3,5-trimethyl benzene and 1,2,4-trimethyl benzene were deemed to be significant.

The instantaneous glc results of 1,2,4-trimethyl benzene was the most significant with 7 excursions above 100 ug/m^3 and 21 readings between 50 ug/m^3 to 100 ug/m^3 with the maximum being 231 ug/m^3 .

Relating these instantaneous results to the 30-minute Guideline (benchmark) is very difficult. However during the time period 0559 hours to 0829 hours on July 24th, under light (2-5 km/hr) northwest winds and a slight nocturnal inversion (as indicated by early morning fog and the vertical temperature/wind profile of the atmosphere acquired at 1030 hours - refer to minisonde flight #8 on page 36), 8 discrete samples were acquired and analyzed. The mean glc of 1,2,4-trimethyl benzene from these 8 samples was 146 ug/m^3 (approximately $1\frac{1}{2}$ times the benchmark). Again it must be mentioned that the ambient air sample was injected into the gas chromatograph only when the THC analyzer denoted a definite increase and hence this mean glc for 1,2,4-trimethyl benzene (and other hydrocarbon G.C. analyses) will be weighted towards the higher concentration. As mentioned in the THC discussion, this monitoring period resulted in the highest one-hour average glc of THC reported for the entire survey and its value was 7.47 ppm.

During this same monitoring period, the only excursion above 100 ug/m^3 for 1,3,5-trimethyl benzene was recorded and its instantaneous glc was 109 ug/m^3 .
Only

2 other glc values for 1,3,5-trimethyl benzene were found in the range 50 ug/m^3 to 100 ug/m^3 .

The maxima instantaneous glc's of xylenes (total - 1729 ug/m^3), ethyl benzene (374 ug/m^3), toluene (992 ug/m^3) decane (480 ug/m^3), isophorone (676 ug/m^3) and MEK (513 ug/m^3) also indicated that these hydrocarbons were significant in the vicinity of Glidden.

From these 66 samples, the geometric standard deviation for MEK (2.6), toluene (2.5), ethyl benzene (2.8), xylenes (2.5 to 3) and the trimethyl benzenes (2.8 and 2) strongly suggests that these glc's were originating from the vicinity of Glidden Paint.

Correlation analyses between the instantaneous glc's of toluene and m-xylene acquired in the vicinity of Glidden inferred a mutual origin. For 65 degrees of freedom, the correlation coefficient was found to be 0.25 which is significant at the 95% confidence level.

The maximum instantaneous glc of benzene reported for this area was 70 ug/m^3 and was acquired during the early morning (at 0805 hours) on July 29.

MINISONDE FLIGHT #8

+++ THEODOLITE REPORT +++

NAME: JUN.TRI #8 FILE: 7
 LOC: ANTLER & CAMPBELL AVE - PARK
 MET: CLEAR, BEAUTIFUL DAY, WINDS 345/8
 TIME: 07:24:10:39:14 TEMP: 30.28
 B/L: 50 M, 40 DEG ELEV: 100

TIME SEC	HEIGHT M	-WIND DIRECTION-					-WIND SPEED-KM/HR-		---TEMPERATURE---DEG-C---		
		N	E	S	W	N	0	15	10	30	
690	2277					+		*		+	
660	2178					+		*		+	
630	2079					+		*		+	
600	1980					+		*		+	
570	1881					+		*		+	
540	1782					+		*		+	
510	1683					+		*		+	
480	1584					+		*		+	
450	1485					+		*		+	
420	1386					+		*		+	
390	1287					+		*		+	
360	1188					+		*		+	
330	1089					+		*		+	
300	990					+		*		+	
270	891					+		*		+	
240	792					+		*		+	
210	693					+		*		+	
180	594					+		*		+	
150	495					+		*		+	
120	396					+		*		+	
90	297					+		*		+	
60	198					+		*		+	
30	99					+		*		+	

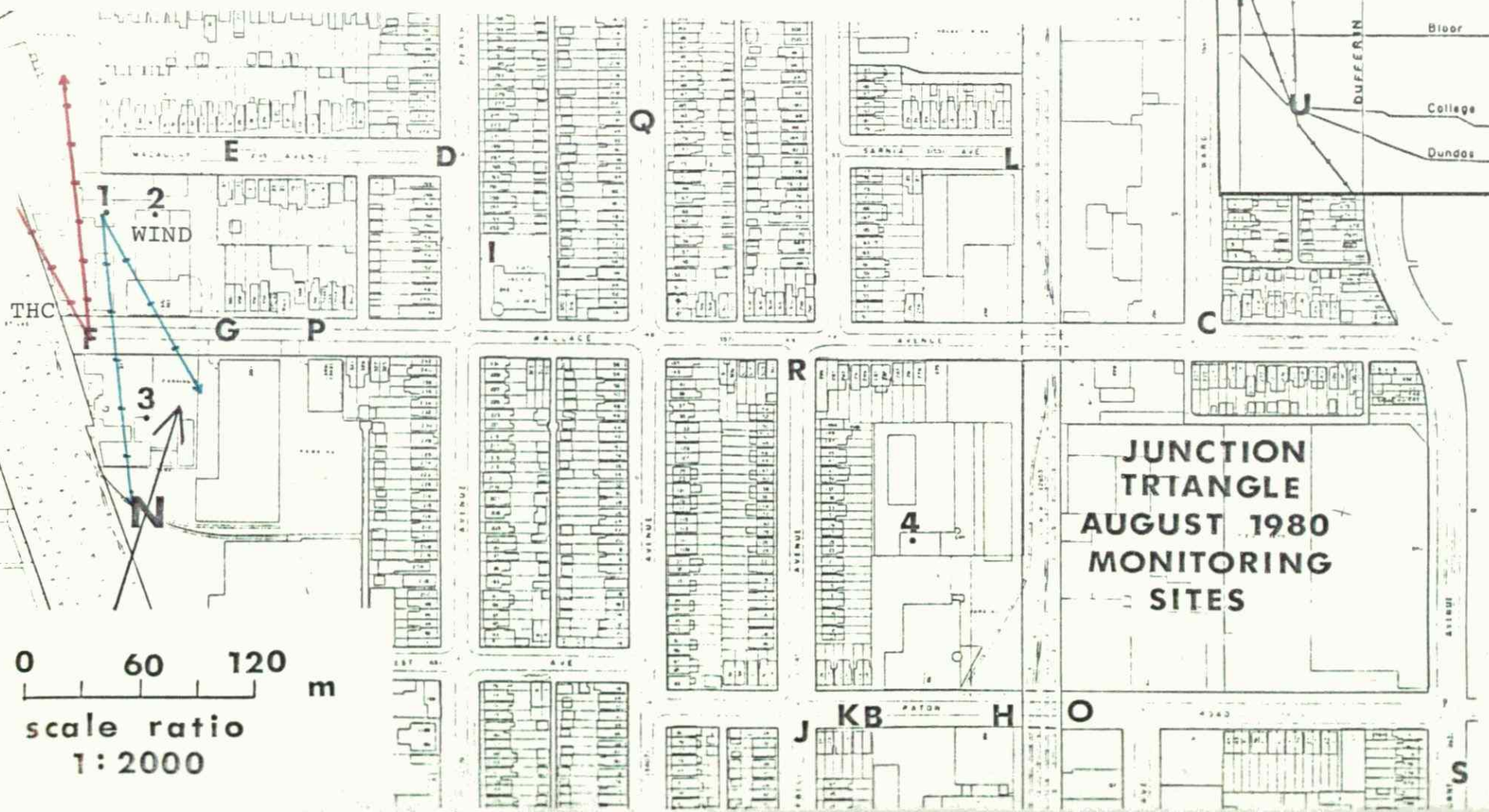
JUN. TRI #16

05:51 JUL 24 1980
 LENGTH= 2.9 HRS
 DELAY= 0 MIN
 LOC: FOOTBRIDGE AT W END OF WALLACE; 0.06KM & 170DEG / GLIDDEN

SCAN= 60 SEC AVE= 30 MIN
 MINIMUM MEAN= 1 PPM
 WIND RANGE= 0 / 11 KM/HR

PREVAILING WINDS; BLOWING TOWARDS:
 1 DIV= 10 %

ARITHMETIC MEAN: THC
 1 DIV= 1 PPM



GC HYDROCARBON DATA

TABLE #6

LOCATION	GLIDDEN
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

NB. - Blanks mean not detected																				
RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH-ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL BENZENE	m-P XYLENE	CYCLO-HEXANONE	O-XYLENE	NONANE	ISO-PROPYL BENZENE	n-PROPYL BENZENE	1,3,5-TRI-METHYL-BENZENE	1,2,4-TRI-METHYL-BENZENE	DECANE	ISO-PHORONE
	MAXIMUM VALUE		513	70	73	20	213	992	84	374	1243	565	486	291	36	80	109	231	480	676
	MINIMUM VALUE		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	5	nd	nd	nd	nd	12	nd	
	LOWEST DETECTABLE VALUE		9	5	73	5		18	15	4	18	37	5	12	2	1	5	12	2	
	GEOMETRIC MEAN (GRAPHIC)		51				3	150		35	150		46				11.5	40		-38+
	GEOMETRIC ST. DEV.		2.6					2.5		2.8	2.5		3				2.8	2		
	GUIDELINE (30-min)		31,000					2,000		4,000	2,300		2,300				100	100		
	# EXCURSIONS ABOVE GUIDELINE		0					0		0	0		0				1	7		
	COMMENTS:		66 AMBIENT AIR SAMPLES																	

ii- Anchor Cap

Sixty three ambient air samples were acquired in the vicinity of Anchor Cap and the subsequent analyses are summarized in Table #7 on page 43. Again using the premis mentioned in the Glidden discussion, only the instantaneous glc's of 1,3,5-trimethyl benzene and 1,2,4-trimethyl benzene were deemed to be significant.

The instantaneous glc results of 1,2,4-trimethyl benzene were again the most prominant with 21 excursions above of 100 ug/m^3 and 6 glc readings between 50 ug/m^3 and 10 ug/m^3 , with the maximum being 516 ug/m^3 .

Between 1755 hours and 2036 hours on July 17, seven of eight samples analyzed for 1,2,4-trimethyl benzene were greater than 100 ug/m^3 with the maximum being 478 ug/m^3 . The mean glc of 1,2,4-trimethyl benzene for this 2 hour and 40 minute period was 208 ug/m^3 . Two of these eight samples depicted glc's of 1,3,5-trimethyl benzene in excess of 100 ug/m^3 with the maximum being 163 ug/m^3 and one sample contained 152 ug/m^3 of MBK and approximately 380 ug/m^3 of xylenes.

The second monitoring period of elevated concentration results was between 2113 hours and 2239 hours on July 21. Three of the four samples acquired during this 1 1/2 hour period denoted glc's of 1,2,4-trimethyl benzene in excess of 100 ug/m^3 with the maximum being 516 ug/m^3 . The mean glc was 278 ug/m^3 . These four samples had significant glc's of cyclo-hexanone (maximum - 514 ug/m^3 and mean - 291 ug/m^3) and two of the four samples were found to have glc's of nonane in excess of 1000 ug/m^3 with the maximum being 1869 ug/m^3 . Finally, 2 of the 4 samples acquired during this monitoring period depicted glc's of 1,3,5-trimethyl benzene in excess of 100 ug/m^3 with the maximum being 207 ug/m^3 .

On July 23rd between 0743 hours and 0917 hours, 4 consecutive samples were found to have glc's of 1,2,4-trimethyl benzene in excess of 100 ug/m^3 . For this 1½ hour monitoring period, the maximum glc was 139 ug/m^3 and the mean glc was 121 ug/m^3 . For 2 of these 4 samples, glc's of MBK were found to be in excess of 100 ug/m^3 with the maximum being 120 ug/m^3 .

On July 24 between 1918 hours and 2114 hours, 3 of 6 instantaneous samples depicted glc's of 1,2,4-trimethyl benzene in excess of 100 ug/m^3 . The maximum glc of 1,2,4-trimethyl benzene for this 2 hour period was 259 ug/m^3 and the mean of the six samples was 101 ug/m^3 . No other significant glc's for the other hydrocarbons were detected during this monitoring period.

Finally the fifth monitoring period during which excursions above 100 ug/m^3 for 1,2,4-trimethyl benzene were recorded was between 0709 hours and 0918 hours on July 30th. All 7 samples acquired during this 2 hour period exceeded the benchmark of 100 ug/m^3 , with the maximum glc of 1,2,4-trimethyl benzene being 322 ug/m^3 and the mean 227 ug/m^3 . Elevated glc's of 1,3,5-trimethyl benzene were also detected but no results were greater than 95 ug/m^3 . Significant glc's of MBK were detected in all 8 samples collected during this period. The maximum glc of MBK was 289 ug/m^3 and the mean was 195 ug/m^3 .

Again examining the statistical summary table (Table #7 on page 43) for the specific hydrocarbons monitored in the vicinity of Anchor Cap, the geometric standard deviation for MBK (3.0), 1,3,5-trimethyl benzene (4) and 1,2,4-trimethyl benzene (2.5) suggested a discrete source in this area.

Correlation analyses between 1,2,4-trimethyl benzene versus 1,3,5-trimethyl benzene and between 1,2,4-trimethyl benzene versus MBK supports a statement of a mutual source in this area. For 62 degrees of freedom, a correlation coefficient of 0.867 was found between 1,2,4-trimethyl benzene and 1,3,5-trimethyl benzene (deemed highly significant at the 99.9% confidence level) and a correlation coefficient of 0.410 was determined between 1,2,4-trimethyl benzene and MBK (again highly significant at the 99.9% confidence level). These high correlation coefficients were anticipated since the petroleum and coal tar distillates (of which the trimethyl benzenes are major constituents) and MBK were expected to have originated from the same emission point (building #7 at Anchor Cap as referenced in internal memo to C.J. Macfarlane from Kawasaki and Martin on February 21, 1980).

Lower glc's of toluene, xylenes and ethyl benzene were found in the vicinity of Anchor Cap (geometric mean - 36 ug/m^3 , 69 ug/m^3 and 12 ug/m^3 respectively) as compared to the results obtained in the vicinity of Glidden (geometric mean - 150 ug/m^3 , 196 ug/m^3 and 35 ug/m^3 respectively).

The maximum glc of benzene detected in the vicinity of Anchor Cap was 60 ug/m^3 , which is essentially the same as that reported for Glidden.

JUN. TRI #26

06:31 JUL 30 1980

LENGTH= 3.7 HRS

DELAY= 0 MIN

LOC: PATON RD., JUST W OF RR; 0.11KM & 135DEG / ANCHOR CAP

PREVAILING WINDS; BLOWING TOWARDS:

1 DIV= 100 %

ARITHMETIC MEAN: THC

1 DIV= 1 PPM

SCAN= 60 SEC

MINIMUM MEAN= 1 PPM

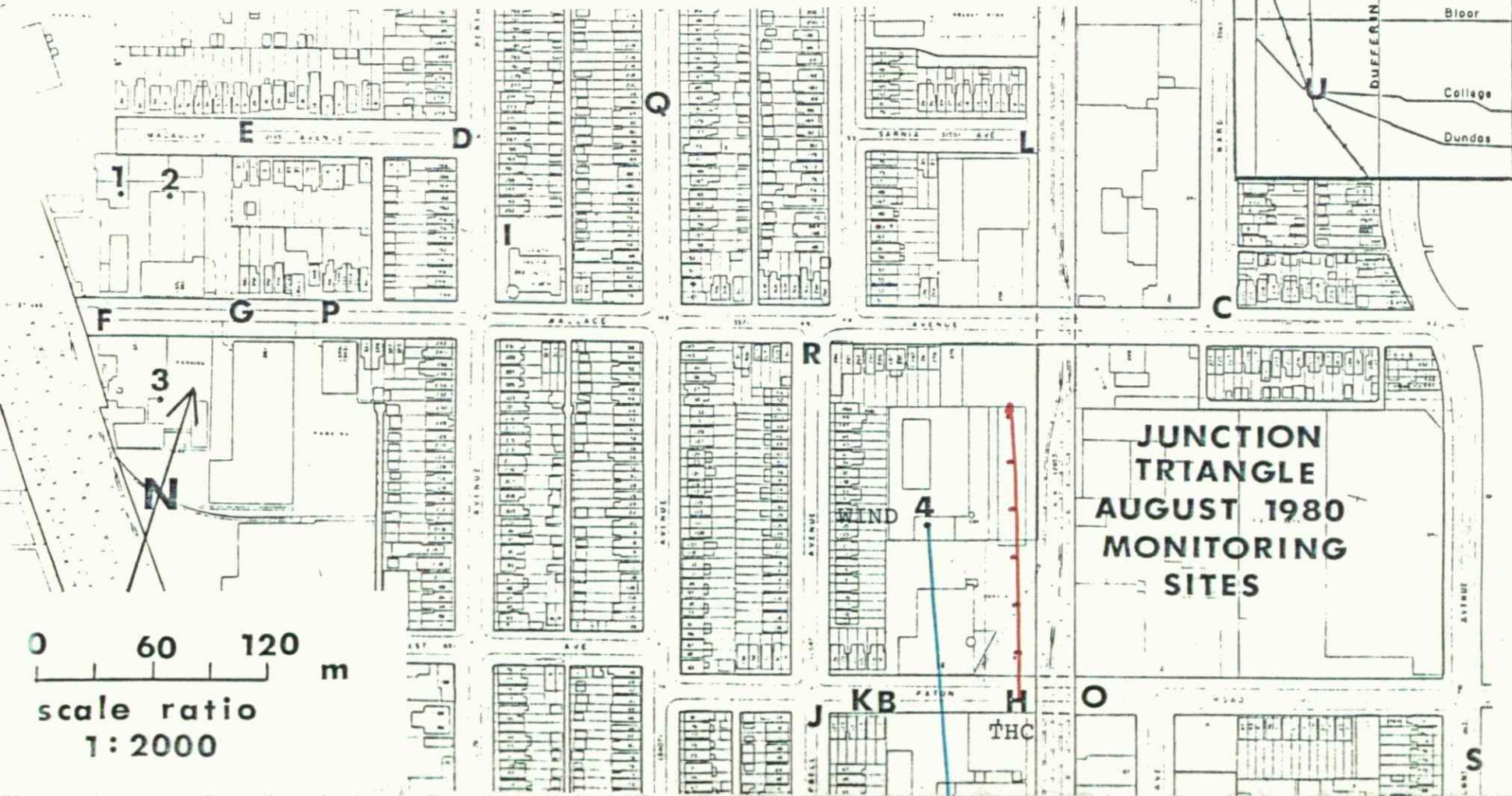
WIND RANGE= 0 / 20 KM/HR

AVE= 60 MIN

PPM

20 KM/HR

ANCHOR CAP



GC HYDROCARBON DATA

TABLE 7

LOCATION	ANCHOR CAP
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

Units - ug/m³

NB.- Blanks mean not detected

[illegible]

iii- Nacan

Sixteen ambient air samples were acquired in the vicinity and directly downwind of Nacan and the subsequent analyses are summarized in Table #8 on page 45.

Immediately obvious from this table are the low glc's reported for the various hydrocarbons (with the exception of MEK) and that no instantaneous readings for the specific hydrocarbons were found to be in excess of their respective benchmarks. The maximum glc's reported for 1,3,5-trimethyl benzene and 1,2,4-trimethyl benzene were 33 ug/m^3 and 53 ug/m^3 respectively.

The only significant glc's acquired in the vicinity of Nacan was for toluene and methyl ethyl ketone (MEK). Its maximum glc of toluene was 225 ug/m^3 -approximately the same glc reported for Anchor Cap and $\frac{1}{4}$ the amount reported for Glidden. Seven of the reported 15 MEK glc's comprising this segment of the ambient air survey were greater than 100 ug/m^3 with the maximum glc being 738 ug/m^3 ; the highest reported glc value acquired during this survey.

The maximum glc for total xylenes was 180 ug/m^3 .

The maximum glc for benzene was 85 ug/m^3 .

GC HYDROCARBON DATA

TABLE 8

LOCATION	NACAN
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

Run #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m-P XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
	MAXIMUM VALUE		738	85				225		48	130		49	110			33	53		
	MINIMUM VALUE		9	nd				36		nd	nd		nd	nd			nd	8		
	GUIDELINES (30-min)		31,000	10,000 (under review)	45	860		2,000		4,000	2,300		2,300		100 (provisional)		100	100		
	GEOMETRIC MEAN		42	13.5				82.4		6.3	35		11.6				6	21.8		45
	# TIMES OVER GUIDELINE		0	0	0	0		0		0	0		0	0			0	0		
	COMMENTS: 16 AMBIENT AIR SAMPLES: GEOMETRIC ANALYSES - MATHEMATICAL / CALCULATOR																			

iv- General

During the last two days of this ambient air survey, the MAM unit was positioned at several locations, apart from the three aforementioned plants, throughout the Junction Triangle. The weather was similar to a regular monitoring day during the past two weeks.

Twenty-one instantaneous samples were acquired at 6 different monitoring sites throughout this area and the results are summarized in Table #9 on page 47.

Low glc's of the various hydrocarbons were detected during this aspect of the survey. The maximum glc of 1,2,4-trimethyl benzene was 41 ug/m^3 and for 1,3,5-trimethyl benzene 16 ug/m^3 . The maximum glc's for total xylenes was 142 ug/m^3 , for toluene 153 ug/m^3 and for benzene 92 ug/m^3 . This glc value for benzene was the highest reported during this survey but at the time of monitoring, the MAM unit was located downwind of a gas station located at Dundas and College Streets.

GC HYDROCARBON DATA

TABLE 9

LOCATION	GENERAL - JUNCTION TRIANGLE
----------	-----------------------------

Units - ug/m³

NB.- Blanks mean not detected

[illegible]

v- Comments

- A. In general the maximum glc's for the various hydrocarbons were detected during the early morning hours under calm meteorological conditions (induced by subsidence or nocturnal cooling) or at night after 2100 hours EST under similar conditions.
- B. Source delineation especially between Nacan and Glidden was very critical during this survey due to the close proximity of these two plants and the realization that most of the monitoring was conducted along McCauley Street. Great care and attention was taken by the field operators so as to ensure that the acquired data (instantaneous sampling) was taken from locations indicative of only one source. This sometimes meant using a sampling hose connected to the sample probe on the MAM unit for more directional acquisition of the ambient air sample.
- C. Humid, hot and unstable meteorological conditions generally persisted throughout the daytime monitoring periods comprising this survey.
- D. The main aim of this survey was to acquire maximum glc values for the specific hydrocarbons.
- E. A number of odour complaints were received and responded to by the MAM personnel. However by the time the call was received, often

several hours had lapsed between the time the call was taken by the Central Region office and the time it was received by the MAM unit. Needless to say, when the MAM personnel responded, the odour had dissipated in the area of concern.

09.

APPENDIX

A.

Concentration/Time Graphs

June Tri #2; THC, TCH-M, O₃-----Graph #1

June Tri #5; THC, THC-M, O₃-----Graph #2

June Tri #8; THC, THC-M, O₃-----Graph #3

June Tri #12; THC,THC-M,O₃-----Graph #4

June Tri #16; THC,THC-M,O₃-----Graph #5

June Tri #18; THC,TCH-M, O₃-----Graph #6

June Tri #26; THC,THC-M, O₃-----Graph #7

B.

Statistical Summary Tables - Continuous Monitored Data.

Ambient Air Quality; THC, THC-CH₄- Table #10 a, b

Ambient Air Quality; CH₄, O₃ Table #11 a,b

30-min. Average Concentrations; THC,THC-CH₄-Table #12 a,b,c

30-min. Average Concentrations; CH₄, O₃--Table #13 a,b,c,

C.

Gas Chromotograph-Hydrocarbon data

Glidden Table 14 a,b,c,d,e,

Anchor Cup Table #15 a,b,c,d,e,

Nacan Table #16

General Table #17 a,b

D.	Glidden - Toluene VS m-xylene	Graph #8
	Anchor Cap - MBK VS 1,2,4-trimethyl benzene	Graph #9
	Anchor Cap - 1,3,5-trimethyl benzene VS 1,2,4,-trimethyl benzene	Graph #10

JUN.TRI #2

18:05 JUL 17 1980

SCAN= 00

SEC

AVE= 00

MIN

75M W OF RR ON PATON RD.; E. BSKN & 175DEG / ANCHOR CAP

E.021
29
67
1005

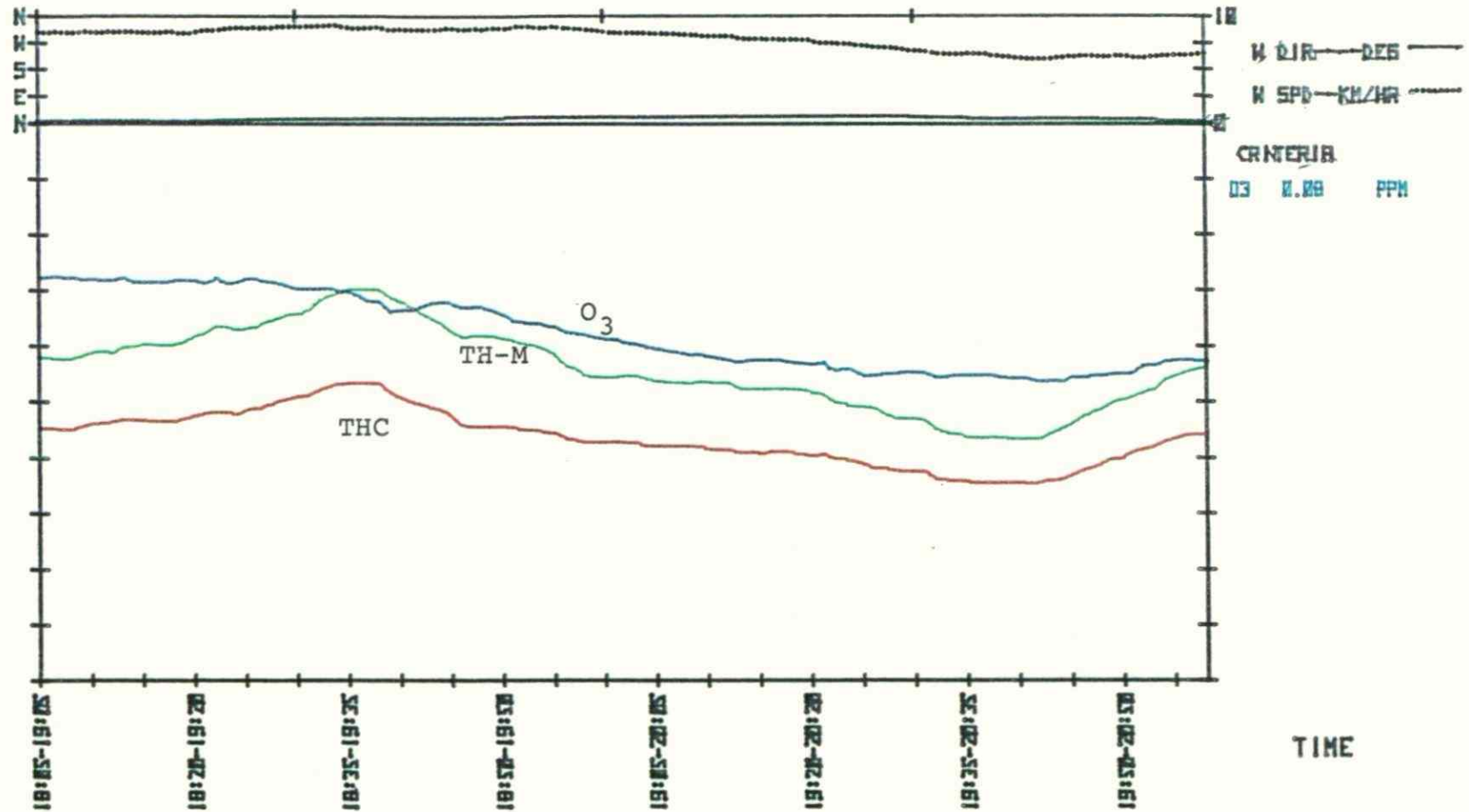
E.017
28
68
1005

E.011
27
69
1007

E.005
26
72
1007

SRAD W/CH2
TEMP DEG C
HUM % REL
PRES MBAR

THC 1.0 X 10 PPM
TH-M 1.0 X 10 PPM
O3 1.0 X 10 PPM



JUN.TRI #5

12:25 JUL 21 1988

SCN= 60

SEC

AVE= 60

KIN

30 HACHULRY ST.; E. BEKM & E30DES / BLIDDEN TANK FARM

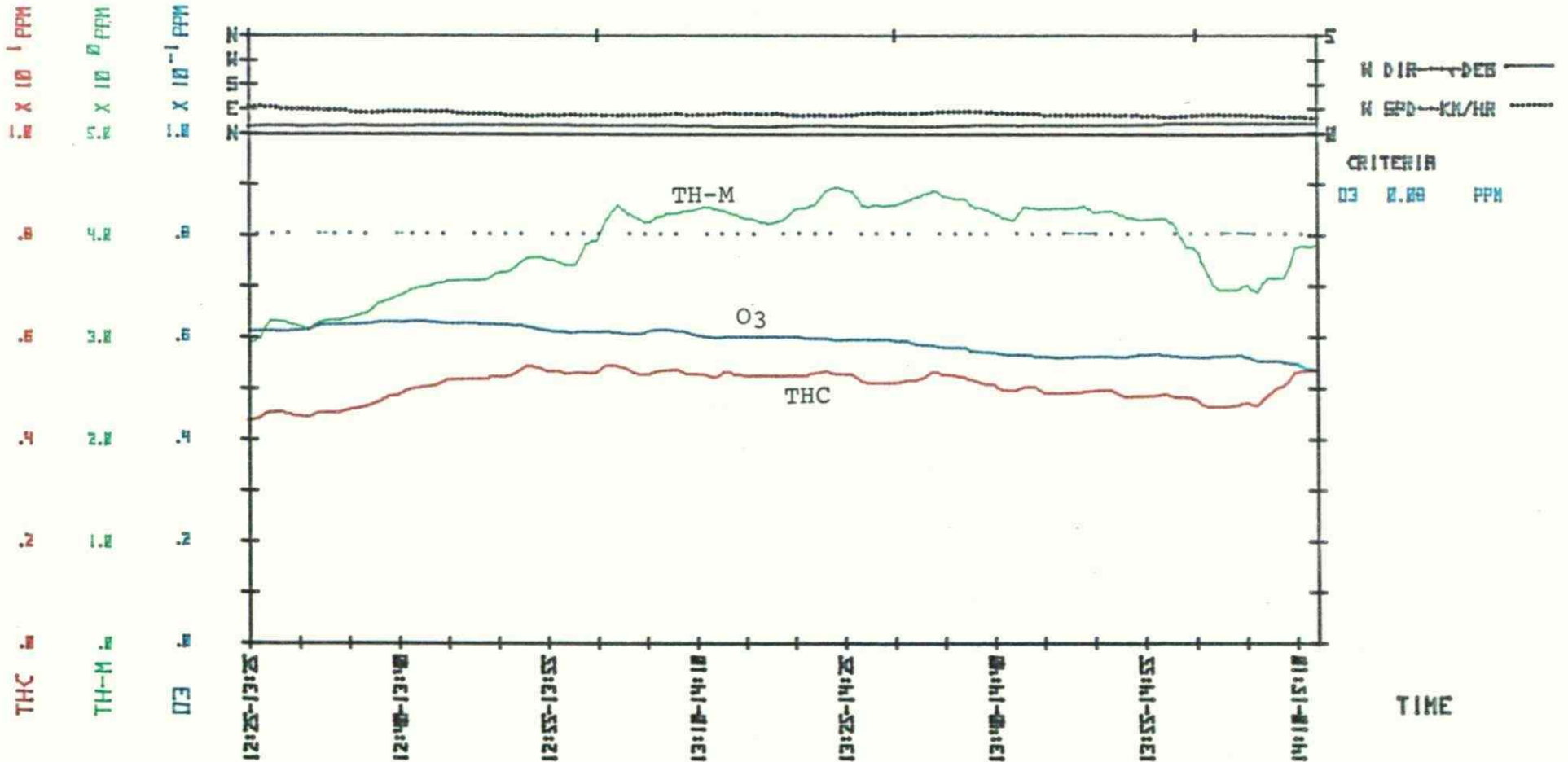
E.047
33
67
1011

E.051
34
63
1010

E.045
33
62
1010

E.022
32
64
1010

SRAD W/CH2
TEMP DEG C
HUM % REL
PRES MBAR



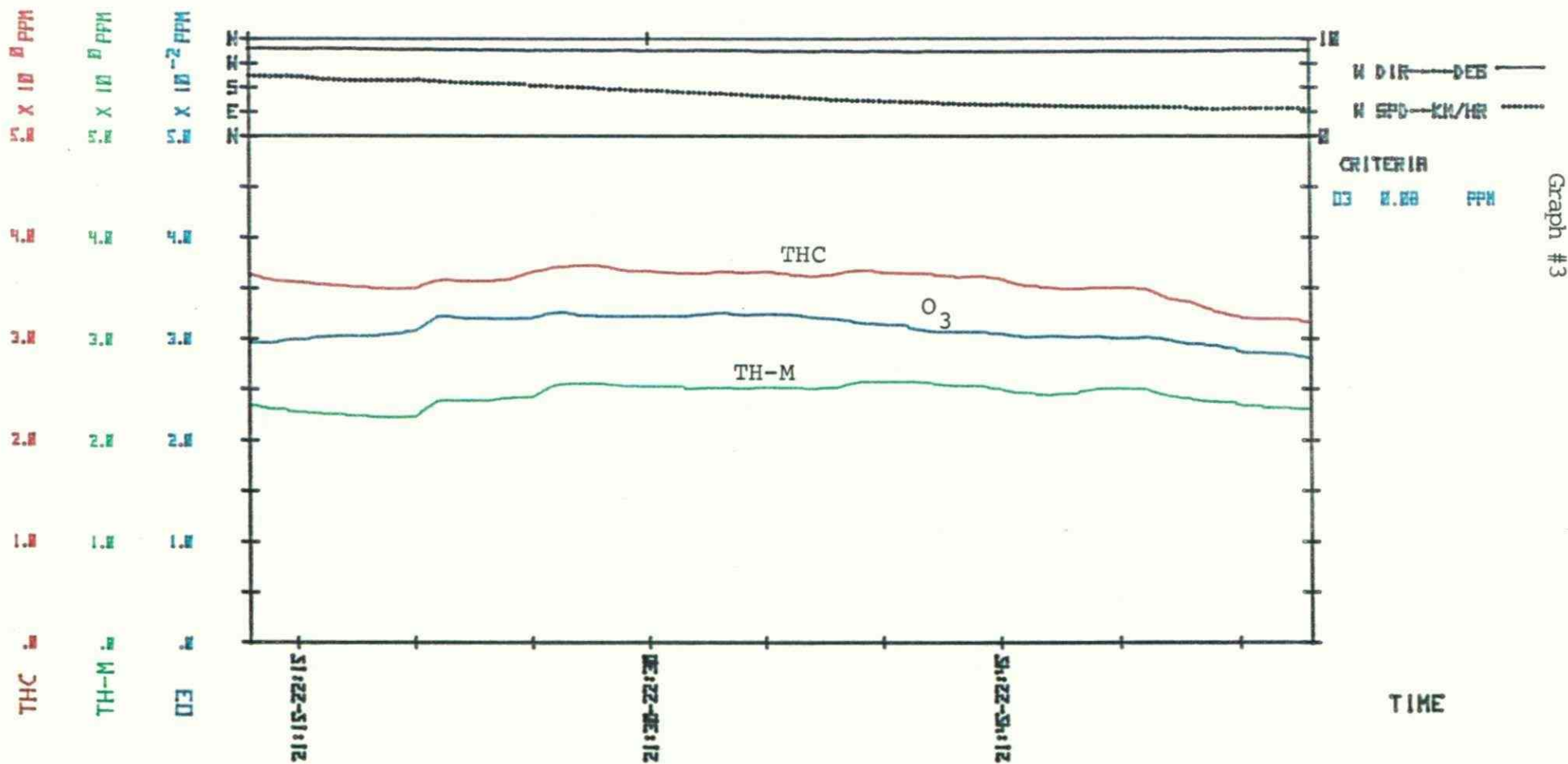
Graph #2

21:13 JUL 21 1988 SCRN= 60 SEC RVE= 60 MIN
PATON RD., JUST W OF RR; E. 11 KM & 135 DEG / ANCHOR CAP

2. 2000
28
85
1 2000

28
28
1 285

SARD	N/CHZ
TEMP	DEG C
HUM	% REL
PRES	MMHG



Graph #3

JUN.TRI #12

03:30 JUL 23 1988 SCAN= 00 SEC 000 AVE= 00 MIN
 PRTON RD., JUST W OF RR; E.11KM & 135DEE / ANCHOR CHP

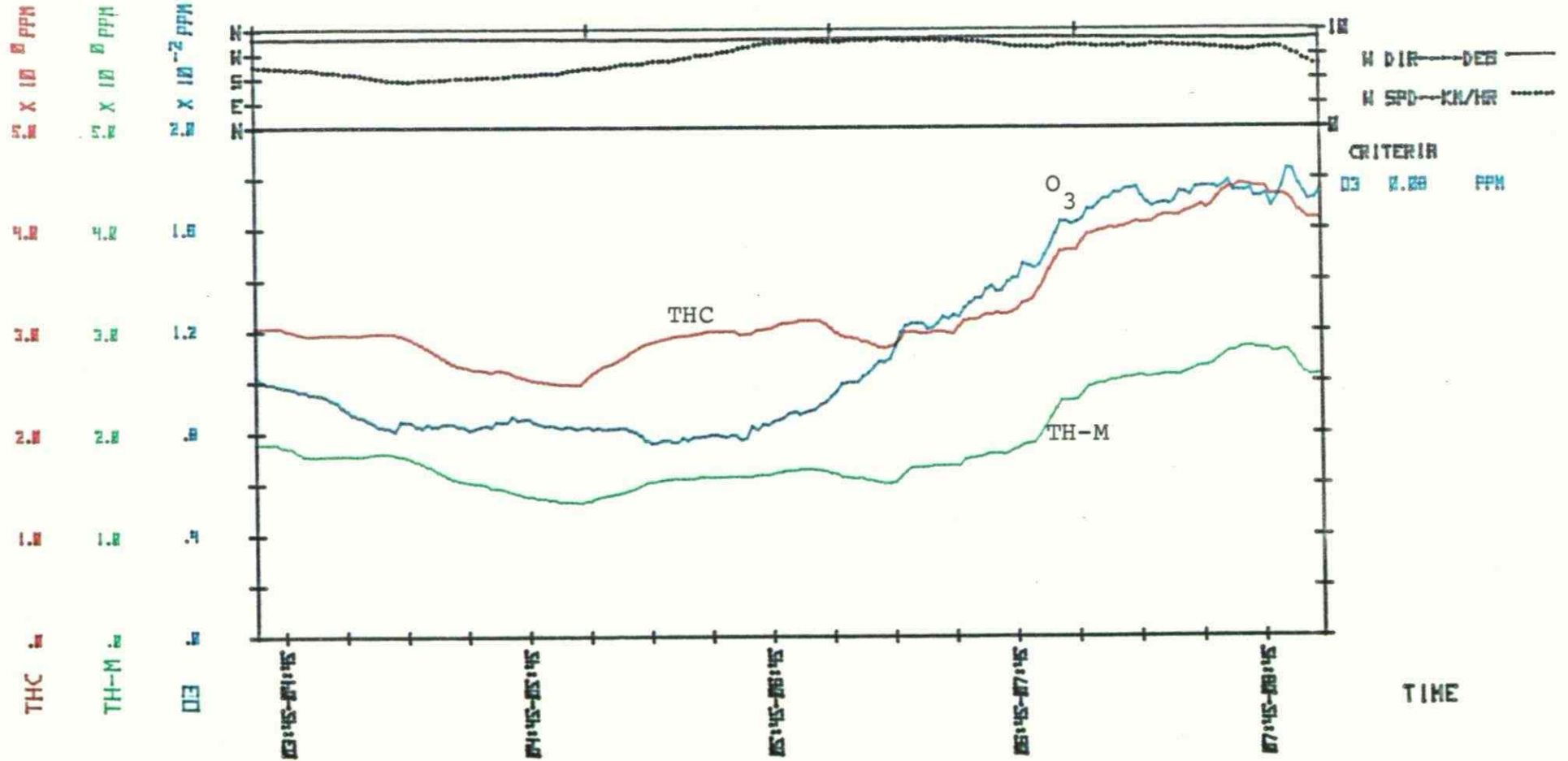
0.000
 10
 0
 1007

0.000
 10
 0
 1007

0.000
 10
 0
 1007

0.012
 20
 0
 1007

SARD W/CN2
 TEMP DEE C
 HUM % REL
 PRES HBAR



JUN.TRI #16

05:51 JUL 24 1988

SCAN# 60

SEC

AVE# 60

MIN

FOOTBRIDGE AT W END OF WALLACE; E. 85KM & 170DEG / GLIDDEN

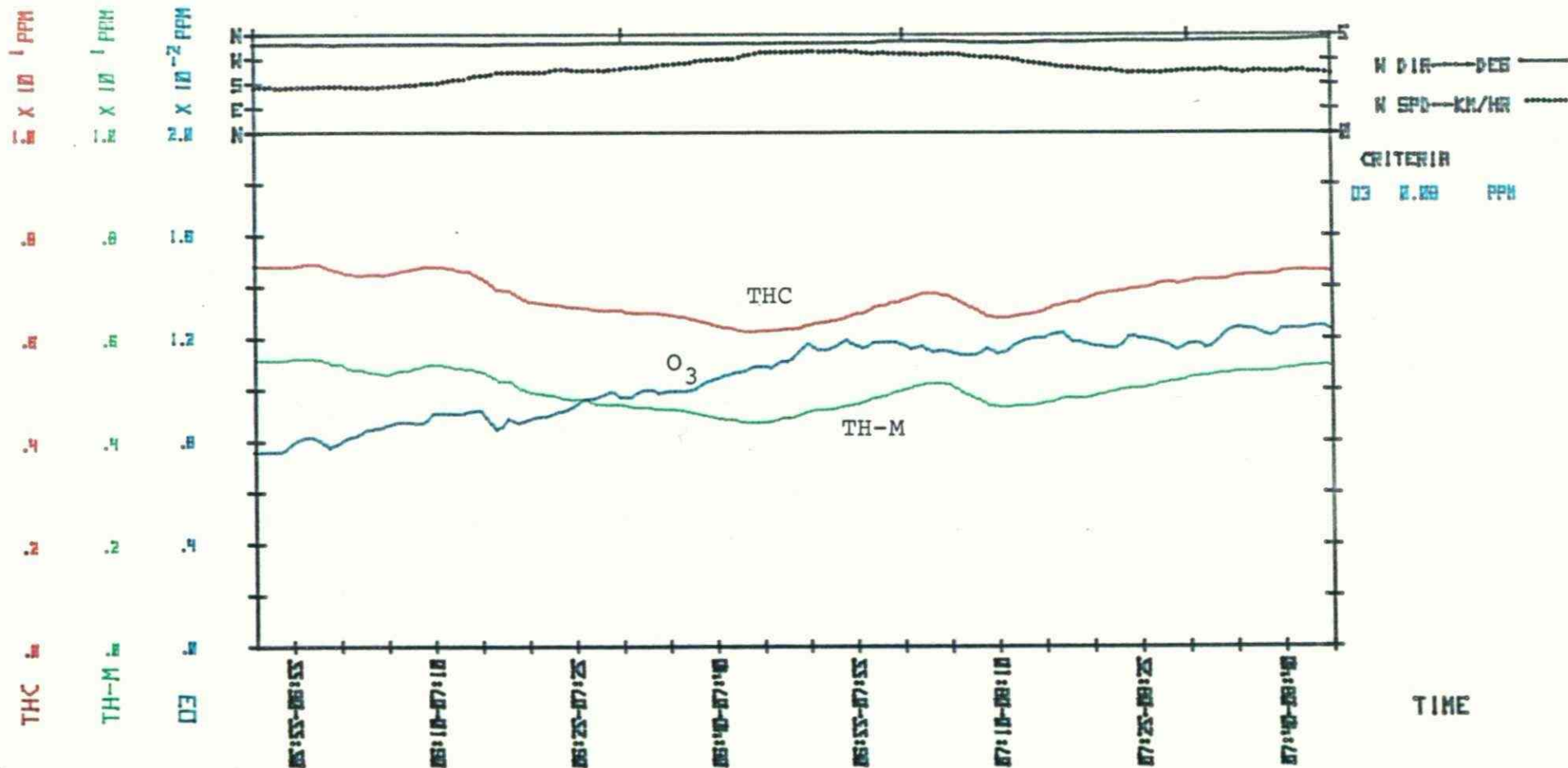
0.000
16
100
1013

0.000
17
100
1013

0.000
18
90
1014

0.000
19
87
1014

SRPD K/CH2
TEMP DEG C
HUM % REL
PRES HBAR



JUN.TRI #18

19:16 JUL 24 1980

SCAN= 60

SEC

AVE= 60

MIN

SARIN AVE. AT RR TRACKS; E.21KM & BRIDGES / ANCHOR CAP

E.005
28
50
1012

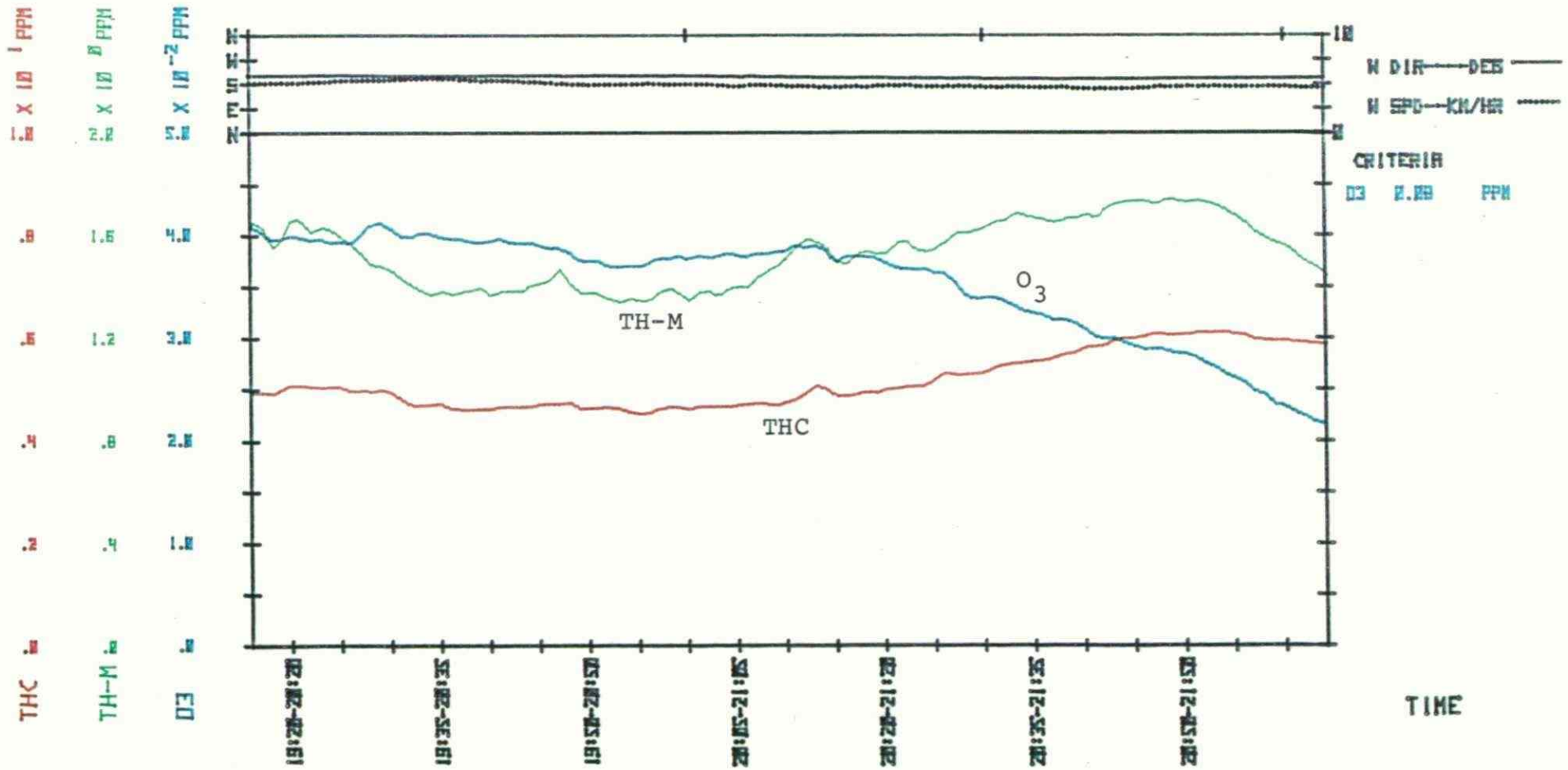
E.001
25
60
1012

E.000
25
71
1012

E.000
25
79
1012

SARIN
TEMP
HUM
PRES

N/CM2
DEB C
S REL
MBAR

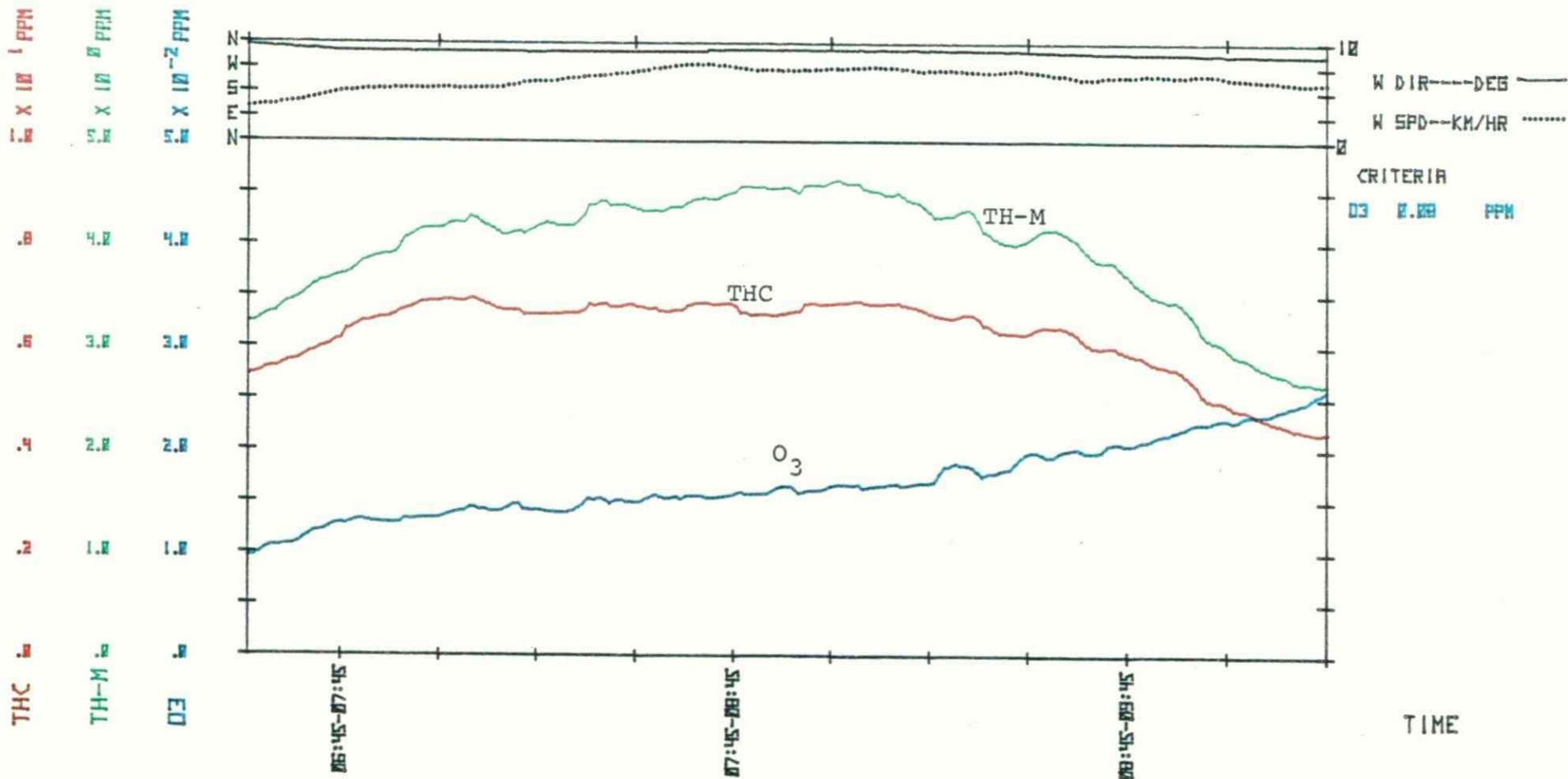


Graph #6

JUN.TRI #26

06:31 JUL 30 1980 SCAN= 60 SEC AVE= 60 MIN
PATON RD., JUST W OF RR; 0.11KM & 135DEG / ANCHOR CAP

0.007	0.013	0.021	0.030	0.038	0.045	SRAD	W/CHZ
5	20	21	22	23	24	TEMP	DEG C
75	100	98	93	85	79	HUM	% REL
996	1008	1008	1008	1008	1008	PRES	MBAR



Graph #7

TABLE # 10a

AMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF MACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 60-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME Min.
			THC		THC = CH4		THC	THC-CH4	THC	THC-CH4	
			Min.	Max.	Min.	Max.					
JUN. TRI # 1	17	10:23-12:50	1.31	3.82	0.720	1.55	2.13	1.24	2.06	1.18	1.5
2	17	18:05-20:56	1.95	13.8	1.19	7.07	5.33	3.49	4.39	2.82	1
3	18	13:05-14:50	1.66	4.03	0.855	2.96	2.36	1.44	2.22	1.35	1
4	18	15:19-16:28	1.86	18.8	1.01	11.0	4.39	2.66	4.36	2.91	1
5	21	12:25-15:10	2.06	20.3	1.28	22.7	5.45	4.45	5.00	3.71	1
7	21	17:29-20:53	2.59	16.2	1.42	21.0	5.79	4.42	5.13	3.93	1
8	21	21:13-22:58	1.08	7.58	1.15	11.4	3.70	2.59	3.50	2.42	1
9	22	20:47-22:02	2.19	16.5	1.12	7.67	3.85	2.10	3.72	2.09	1
11	23	01:14-02:53	1.93	5.90	1.04	6.37	3.06	1.94	2.82	1.70	1
12	23	03:38-08:56	2.05	10.3	1.05	8.17	4.41	2.82	3.27	1.93	1
13	23	14:40-16:13	1.93	11.9	0.895	9.70	3.99	2.49	3.57	2.17	1
15	23	19:16-22:04	2.12	16.1	0.985	6.38	3.79	2.25	3.54	2.03	1
16	24	05:51-08:45	3.16	15.1	2.15	13.1	7.47	5.61	6.99	5.16	1
COMMENTS;											

10b

AMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAM, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 60-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME
			THC		THC - CH4		THC	THC - CH4	THC	THC - CH4	Min.
			Min.	Max.	Min.	Max.					
JUN, TRI #17	24	09:01-10:10	2.43	10.1	1.33	6.86	4.04	2.53	3.99	2.42	1
18	24	19:16-22:04	0.006	11.7	0.001	5.62	6.09	1.74	5.12	1.49	1
20	25	07:08-08:20	1.82	18.7	1.46	14.2	5.30	3.80	5.15	3.63	1
24	29	07:10-09:13	2.25	12.7	1.38	14.1	5.96	5.04	4.91	3.95	1
26	30	06:31-10:13	2.09	16.7	0.936	11.6	6.95	4.63	5.74	3.56	1
27	30	11:21-13:39	2.00	9.12	0.898	7.85	5.63	4.02	4.98	3.37	1
28	30	17:43-19:43	1.96	9.90	1.43	5.76	3.84	2.89	3.53	2.57	1
33	31	18:35-20:02	2.07	8.09	1.35	3.71	3.10	1.89	2.96	1.83	1
34	31	20:43-22:19	2.25	7.25	1.40	5.24	3.37	2.07	3.21	2.02	1

COMMENTS:

11a

AMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 60-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME Min.
			CH ₄		O ₃		CH ₄	O ₃	CH ₄	O ₃	
JUN. TRI # 1	17	10:23-12:50	0.344	0.820	0.031	0.406	0.770	0.055	1.18	0.047	1.5
2	17	18:05-20:56	0.788	1.64	0.002	0.093	1.00	0.036	0.955	0.032	1
3	18	13:05-14:50	0.718	0.947	0.012	0.041	0.778	0.024	0.770	0.023	1
4	18	15:19-16:28	0.774	1.90	0.001	0.093	1.01	0.028	1.02	0.027	1
5	21	12:25-15:10	0.666	2.42	0.001	0.112	0.877	0.063	0.823	0.058	1
7	21	17:29-20:53	0.809	2.28	0.001	0.093	1.16	0.039	1.06	0.030	1
8	21	21:13-22:58	0.619	2.37	0.002	0.110	0.826	0.032	0.794	0.029	1
9	22	20:47-22:02	1.01	3.93	0.001	0.056	1.26	0.009	1.24	0.008	1
11	23	01:14-02:53	0.969	1.36	0.001	0.043	1.04	0.009	1.04	0.008	1
12	23	03:38-08:56	0.932	1.93	0.001	0.068	1.37	0.018	1.16	0.012	1
13	23	14:40-16:13	0.964	2.02	0.008	0.067	1.23	0.027	1.18	0.026	1
15	23	19:16-22:04	1.08	1.85	0.001	0.063	3.79	0.019	1.24	0.016	1
16	24	05:51-08:45	1.06	1.96	0.001	0.039	1.40	0.012	1.30	0.010	1

COMMENTS:

TABLE # 11bAMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER		DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 60-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME
				CH ₄		O ₃		CH ₄	O ₃	CH ₄	O ₃	Min.
				Min.	Max.	Min.	Max.					
JUN. TRI	#17	24	09:01-10:10	0.939	1.45	0.001	0.011	1.11	0.019	1.10	0.018	1
	18	24	19:16-22:04	0.001	8.69	0.001	0.111	5.68	0.041	4.54	0.034	1
	20	25	07:08-08:20	0.313	4.04	0.001	0.076	0.990	0.014	0.908	0.013	1
	24	29	07:10-09:13	0.557	1.48	0.001	0.045	0.768	0.018	0.705	0.014	1
	26	30	06:31-10:13	1.18	2.85	0.001	0.092	2.02	0.025	1.67	0.017	1
	27	30	11:21-13:39	1.12	1.53	0.006	0.053	1.23	0.030	1.21	0.028	1
	28	30	17:43-19:43	0.005	0.012	0.020	0.022	0.009	0.021	0.009	0.020	1
	33	31	18:35-20:02	0.216	0.558	0.024	0.050	0.339	0.039	0.323	0.038	1
	34	31	20:43-22:19	0.132	0.732	0.015	0.050	0.325	0.040	0.296	0.037	1

TABLE # 12aAMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 30-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME Min.
			THC		THC-CH ₄		THC	THC - CH ₄	THC	THC - CH ₄	
			Min.	Max.	Min.	Max.					
JUN. TRI # 1	17	10:23-12:47	1.31	3.82	0.720	1.55	2.15	1.25	2.06	1.18	1.5
2	17	18:05-20:53	1.95	13.8	1.19	7.07	5.40	3.55	4.39	2.82	1
3	18	13:05-14:47	1.66	4.03	0.855	2.96	2.40	1.50	2.22	1.35	1
4	18	15:19-16:25	1.86	18.8	1.01	11.0	5.03	3.00	4.36	2.71	1
5	21	12:25-15:07	2.06	20.3	1.28	22.7	5.91	4.98	5.00	3.71	1
6	21	15:33-16:21	2.02	13.5	1.17	8.96	3.87	2.41	3.75	2.35	1
7	21	17:29-20:53	2.59	16.2	1.42	21.0	6.76	5.92	5.13	3.93	1
8	21	21:13-22:55	1.80	7.58	1.15	11.4	4.43	3.05	3.50	2.42	1
9	22	20:47-21:59	2.19	16.5	1.12	7.67	3.98	2.61	3.72	2.09	1
10	22	22:18-23:12	2.22	13.0	1.13	10.1	4.69	2.87	3.83	2.30	1
11	23	01:14-02:50	1.93	5.90	1.04	6.37	3.70	2.56	2.82	1.70	1
12	23	03:38-08:56	2.05	10.3	1.05	8.17	4.77	3.17	3.27	1.93	1
13	23	14:40-16:10	1.93	11.9	0.895	9.70	4.66	3.14	3.57	2.17	1
COMMENTS;											

TABLE # 12b

AMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 30-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME
			THC		THC - CH ₄		THC	THC - CH ₄	THC	THC - CH ₄	Min.
			Min.	Max.	Min.	Max.					
JUN. TRI #15	23	19:16-22:04	2.12	16.1	0.985	6.38	4.40	2.54	3.54	2.03	1
16	24	05:51-08:45	3.16	15.1	2.15	13.1	8.15	6.42	6.99	5.16	1
17	24	09:01-10:07	2.43	10.1	1.33	6.86	4.23	2.55	3.99	2.42	1
18	24	19:16-22:04	0.006	11.7	0.001	5.62	6.62	2.00	5.12	1.49	1
19	25	06:12-06:54	2.10	3.85	1.55	3.03	2.60	1.89	2.59	1.86	1
20	25	07:08-08:20	1.82	18.7	1.46	14.2	6.37	4.42	5.15	3.63	1
23	29	06:15-06:57	3.14	11.5	2.18	12.0	4.57	3.68	4.61	3.51	1
24	29	07:10-09:10	2.25	12.7	1.38	14.1	7.11	5.92	4.91	3.95	1
25	29	09:35-10:29	1.84	7.71	1.21	6.90	3.39	2.32	2.95	2.17	1
26	30	06:31-10:13	2.09	16.7	0.936	11.6	7.27	4.93	5.74	3.56	1
27	30	11:21-13:39	2.00	9.12	0.898	7.85	5.89	4.16	4.98	3.37	1
28	30	17:43-19:43	1.96	9.90	1.43	5.76	4.31	3.06	3.53	2.57	1
30	30	20:03-21:03	1.92	7.96	1.41	4.52	3.04	2.27	2.76	2.04	1

COMMENTS:

12c

TORONTO-JUNCTION TRIANGLE

44445 - 14PM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP[illegible]

• **PROHIBITIONS;**

TABLE # 13b

AMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN, GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 30-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME Min.
			CH ₄		O ₃		CH ₄	O ₃	CH ₄	O ₃	
JUN. TRI # 1	17	10:23-12:47	0.344	0.820	0.031	0.406	0.779	0.069	0.730	0.047	1.5
2	17	18:05-20:53	0.788	1.64	0.002	0.093	1.03	0.037	0.955	0.032	1
3	18	13:05-14:47	0.718	0.947	0.012	0.041	0.782	0.027	0.770	0.023	1
4	18	15:19-16:25	0.774	1.90	0.001	0.093	1.02	0.030	1.02	0.027	1
5	21	12:25-15:07	0.666	2.42	0.001	0.112	0.900	0.064	0.823	0.058	1
6	21	15:33-16:21	0.664	1.31	0.034	0.140	0.784	0.059	0.784	0.055	1
7	21	17:29-20:53	0.809	2.28	0.001	0.093	1.19	0.041	1.06	0.030	1
8	21	21:13-22:55	0.619	2.37	0.002	0.110	0.847	0.033	0.794	0.029	1
9	22	20:47-21:59	1.01	3.93	0.001	0.056	1.38	0.009	1.24	0.008	1
10	22	22:18-23:12	1.00	2.11	0.001	0.067	1.26	0.013	1.18	0.012	1
11	23	01:14-02:50	0.969	1.36	0.001	0.043	1.06	0.011	1.04	0.008	1
12	23	03:38-08:56	0.932	1.93	0.001	0.068	1.47	0.019	1.16	0.012	1
13	23	14:40-16:10	0.964	2.02	0.008	0.067	1.33	0.028	1.18	0.026	1
COMMENTS;											

TABLE # 13bAMBIENT AIR SURVEY IN TORONTO - JUNCTION TRIANGLE

Units - PPM

GROUND LEVEL CONCENTRATIONS IN THE VICINITY OF NACAN GLIDDEN & ANCHOR CAP

MONITORING LOCATION / NUMBER	DATE July 1980	MONITORING TIME START / END	INSTANTANEOUS CONCENTRATION				MAXIMUM 30-MINUTE AVERAGE CONCENTRATION		MONITORING PERIOD AVERAGE CONCENTRATION		SCAN TIME
			CH ₄		O ₃		CH ₄	O ₃	CH ₄	O ₃	Min.
			Min.	Max.	Min.	Max.					
JUN. TRI #15	23	19:16-22:04	1.08	1.85	0.001	0.063	1.31	0.022	1.24	0.016	1
16	24	05:51-08:45	1.06	1.96	0.001	0.039	1.41	0.013	1.30	0.010	1
17	24	09:01-10:07	0.939	1.45	0.001	0.111	1.13	0.021	1.10	0.018	1
18	24	19:16-22:04	0.001	8.69	0.001	0.111	6.17	0.046	4.54	0.034	1
19	25	06:12-06:54	0.402	0.633	0.001	0.019	0.486	0.006	0.480	0.006	1
20	25	07:08-08:20	0.313	4.04	0.001	0.076	1.20	0.017	0.908	0.013	1
23	29	06:15-06:57	0.878	3.05	0.001	0.035	1.06	0.011	1.07	0.011	1
24	29	07:10-09:10	0.557	1.48	0.001	0.045	0.809	0.019	0.705	0.014	1
25	29	09:35-10:29	0.558	1.10	0.003	0.043	0.725	0.029	0.695	0.025	1
26	30	06:31-10:13	1.18	2.85	0.001	0.092	2.09	0.026	1.67	0.017	1
27	30	11:21-13:39	1.12	1.53	0.006	0.053	1.24	0.032	1.21	0.028	1
28	30	17:43-19:43	0.005	0.012	0.020	0.022	0.009	0.021	0.009	0.020	1
30	30	20:03-21:03	0.005	0.012	0.019	0.022	0.008	0.020	0.008	0.020	1

COMMENTS;

GC HYDROCARBON DATA

TABLE 14a

LOCATION GLIDDEN

Units - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
6	180780	1512	17	19				42		10	51		20				13	64		676
7	180780	1535	9					13		4	24		7				7	45		
8	180780	1559	69				11	105		26	104		35				6	40		
9	180780	1624	34	19				37		6	34		9	29			6	37		269
2	210780	1151	110				52	449		61	238		71				9	51	6	
3	210780	1220	139					19			709		245				5	34		
4	210780	1239	26				25	99		20	83		25		5		8	38		69
5	210780	1259	154				37	385		60	239		76		8		11	55	2	
6	210780	1320	170				14	187		28	113		31				9	46	25	
7	210780	1341	405	27			121	391	66	77	318		94				11	61	7	
8	210780	1408	336				35	908	84		325		97				11	73	83	
9	210780	1429	497				34	843		69	238		65				10	48		
10	210780	1457	115				36	376		64	263		70				11	62		
11	210780	1526		10				70		15	58		22				71	77		
12	210780	1549						5		5	5		5							

GC HYDROCARBON DATA

TABLE 14b

LOCATION GLIDDEN

Units - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
13	210780	1641						27				37	5				6	37		
14	210780	1706						28				56	13				8	36		
15	210780	1729	118				18	644		73	280		16				13	56		
16	210780	1817	230				6	227		49	182		62				39	41		
17	210780	1837	513	35			29	268		48	212		68				8	47		
18	210780	1900	35				11	139		41	154		51				5	35		-70-
19	210780	1921	181	22			56	326		78	285		80				14	52		
20	210780	1943	152	66			63	366		77	273		87			6	15	61		
21	210780	2004	65	37			213	315		76	278		95			8	21	79		
22	210780	2024	126	27			10	316			63	565	14			6	26	59		
23	210780	2043	113	30			63	217			41	412	32			5	25	74		
5	230780	2342		8				72		8	34		10			26	44	41		
6	230780	0114								38	124		50			11	15	48		
7	230780	0133								33	106		29			10	10	21		
8	230780	0158						21		7	30		10			17	33	48		

GC HYDROCARBON DATA

TABLE 14c

LOCATION GLIDDEN

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

[illegible]

GC HYDROCARBON DATA

TABLE 14bLOCATION GLIDDENUnits - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
1	290780	0612	59	14				114		38	152		62	54		9	18	48		
2	290780	0632	17	5				254		39	149		60	47		10	21	60		
3	290780	0705		19				110		32	123		48	12		8	16	45		
4	290780	0726	14			11		96		38	134		51	43		10	23	69		
5	290780	0746	89	10		5	23	440		53	196		69	53		13	23	61		-72-
6	290780	0805	124	70	73	20	36	992		96	377		109	24		11	23	69		
7	290780	0827	24					241		43	183		69	49		10	20	61		
8	290780	0908	181	8			102	424	15	79	291		77			4	22	39		
10	300780	1000					13	18		4	18		5			3	7	37		
11	300780	1022					47	24		12	58		22		2	23				
13	300780	1133	102				78	266		147			116					55		
14	300780	1157						58		17	65		18					22		
15	300780	1216	160	13			74	146		75	284		74			2	6	28		
16	300780	1239	101	18			78	152		101	403		104			2	7	35		
17	300780	1259	134	35			69	158		184	731		182			3	10	37		

GC HYDROCARBON DATA

TABLE 14c

LOCATION GLIDDEN

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

[illegible]

GC HYDROCARBON DATA

TABLE 15a

LOCATION ANCHOR CAP

Units - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
1	170780	1755	59	10			41	48		18	68		25			4	16	112		
2	170780	1826	26				38	45		22					5	15	42	191		
3	170780	1847	34				49	23		21	88		36		5	20	60	284		
4	170780	1906	17				42	21		20	79		31			14	37	176		
5	170780	1926	51				152	29		71	270		114		21	47	120	478		
6	170780	1952	17				52	9			47		17				10	72		
7	170780	2016	86				90	59		37	144		61			21	52	229		
8	170780	2036	9				45	26		16	68		33			11	30	125	52	
1	180780	1309					56	20	49		13						61	82		
2	180780	1339						13			18		5				9	64		
3	180780	1400	9	3		7		26			14						4	31		
4	180780	1422	29				8	14			8						3	26		
5	180780	1446						4										25		

GC HYDROCARBON DATA

TABLE 15b

LOCATION	ANCHOR	CAP
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

[illegible]

GC HYDROCARBON DATA

TABLE 15c

LOCATION	ANCHOR	CAP
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		

Units - ug/m³

NB.- Blanks mean not detected

[illegible]

GC HYDROCARBON DATA

TABLE 15d

LOCATION ANCHOR CAP

Units - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
9	240780	0859						57		34	130		61		2	40	86	234	29	
10	240780	0923						29		12	40		10			3	19	40		
11	240780	0945						29		12	56		13			18	26	111		
1	240780	1918						21		23	91		45		3	19	46	148		
2	240780	1946						45		9	39		10					29		
3	240780	2008						48		9	42		16			2	8	31		
4	240780	2030						17		6	29		11			3	11	37		
5	240780	2051		8				39		17	73		30		1	11	30	100		
6	240780	2114		8				31		24	100		48		7	28	72	259		
6	250780	0835		17				44		12	50		22		1	10	29	97		
7	250780	0903		4				34	77	7	24		5			1	7	30		
8	250780	0926		60				119	38	27	112		45		2	2	67	137		

GC HYDROCARBON DATA

TABLE 15e

LOCATION	ANCHOR CAP
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

[illegible]

GC HYDROCARBON DATA

TABLE 16

LOCATION NACAN

Units - ug/m³

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL- BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
1	220780	1828	13	14				62		15	50		17	27			6	31		
2	220780	2104						137		9	41		14	104			8	26		
3	220780	2215	11	46				93		20	79		46	110			10	40		
4	220780	2237	9	22				67		13	56		20	100			9	40		
2	310780	0607	13	85				225			130		49			3	8	21		
3	310780	0627	12	13				92		40	97		38	51		8	18	53		-79-
4	310780	0648	140	24				149		48	108		37	9		6	14	41		
6	310780	0709	15	8				98		32	60		14			4	10	31		
9	310780	0727	738	23				91			40		14			2	6	18		
8	310780	0749	516	14				162		45	47		14				4	17		
9	310780	0808	203	9				92			27		9				3	15		
10	310780	0829	46	12				44			25		6					14		
11	310780	0859	62	23				36		14	22		4				6	12		
13	310780	0938	124	12				44		4	22		6			5	4	12		
15	310780	1018	107	15				83		4							2	8		
16	310780	1042	134	6				36		5	25		4				33	19		

GC HYDROCARBON DATA

TABLE 17aLOCATION GENERALUnits - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

RUN #	DATE	TIME	MEK	BENZENE	ETHYL ACRYLATE	METHYL METH- ACRYLATE	MBK	TOLUENE	n-OCTANE	ETHYL BENZENE	m- XYLENE	CYCLO- HEXANONE	O- XYLENE	NONANE	ISO- PROPYL BENZENE	n- PROPYL- BENZENE	1,3,5- TRI- METHYL- BENZENE	1,2,4- TRI- METHYL- BENZENE	DECANE	ISO- PHORONE
1	310780	1835						17		3	20		6				4	20		
2	310780	1859		9				28		5	27		10				4	16		
3	310780	1922		11				30		5	24		8				4	16		
4	310780	1945		15				30		4	20		6				3	12		
5	310780	2026		8				23		4	24		9				5	17		
6	310780	2044		7				19		3	16		5				2	10		
7	310780	2103		14				34		5	29		9				4	15		
8	310780	2125		5				20		4	19		7				4	13		
9	310780	2149		10				22		3	20		6				5	21		
10	310780	2209		22				39		5	25		9				3	16		

GC HYDROCARBON DATA

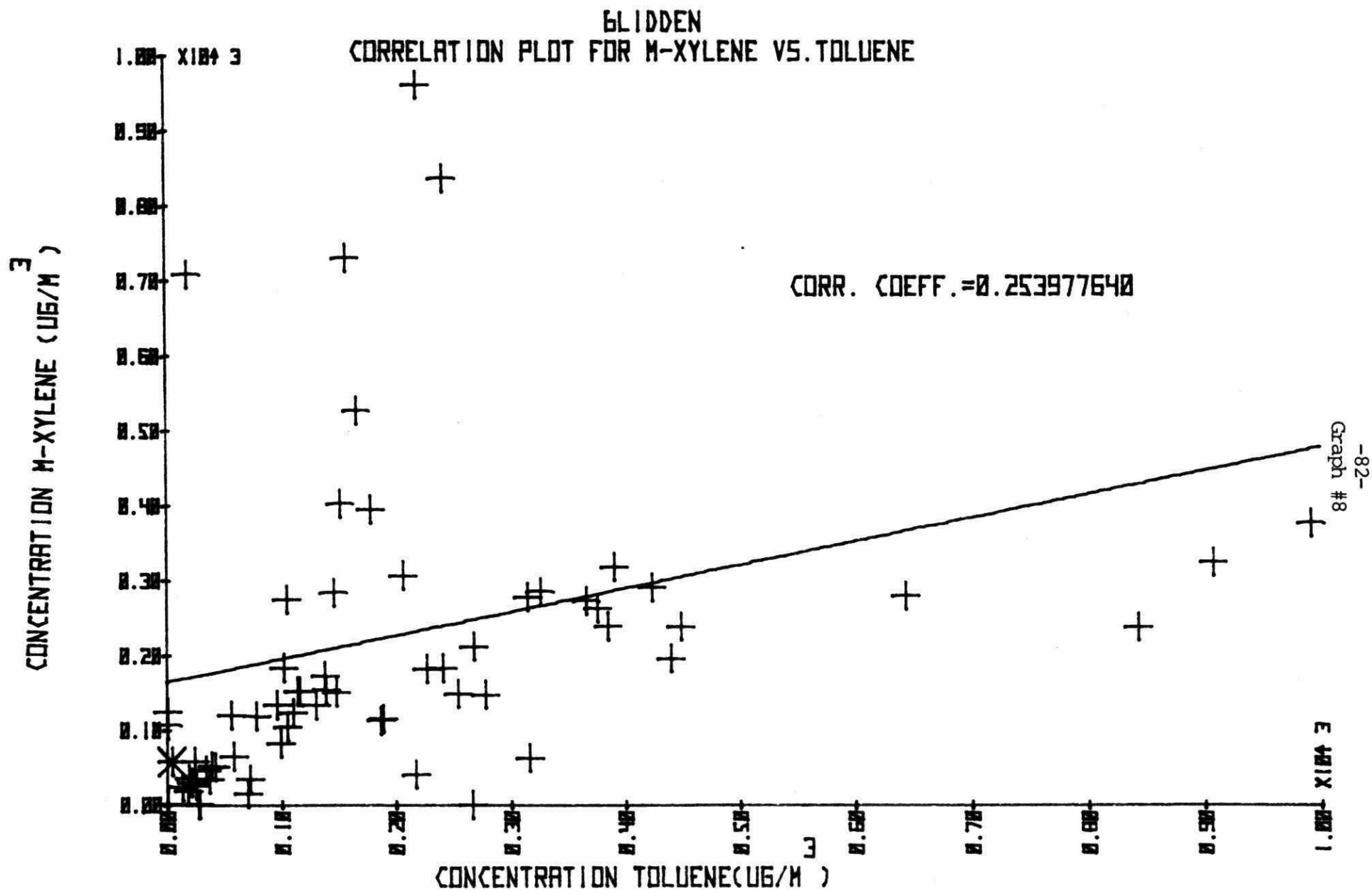
TABLE 17b

LOCATION GENERAL

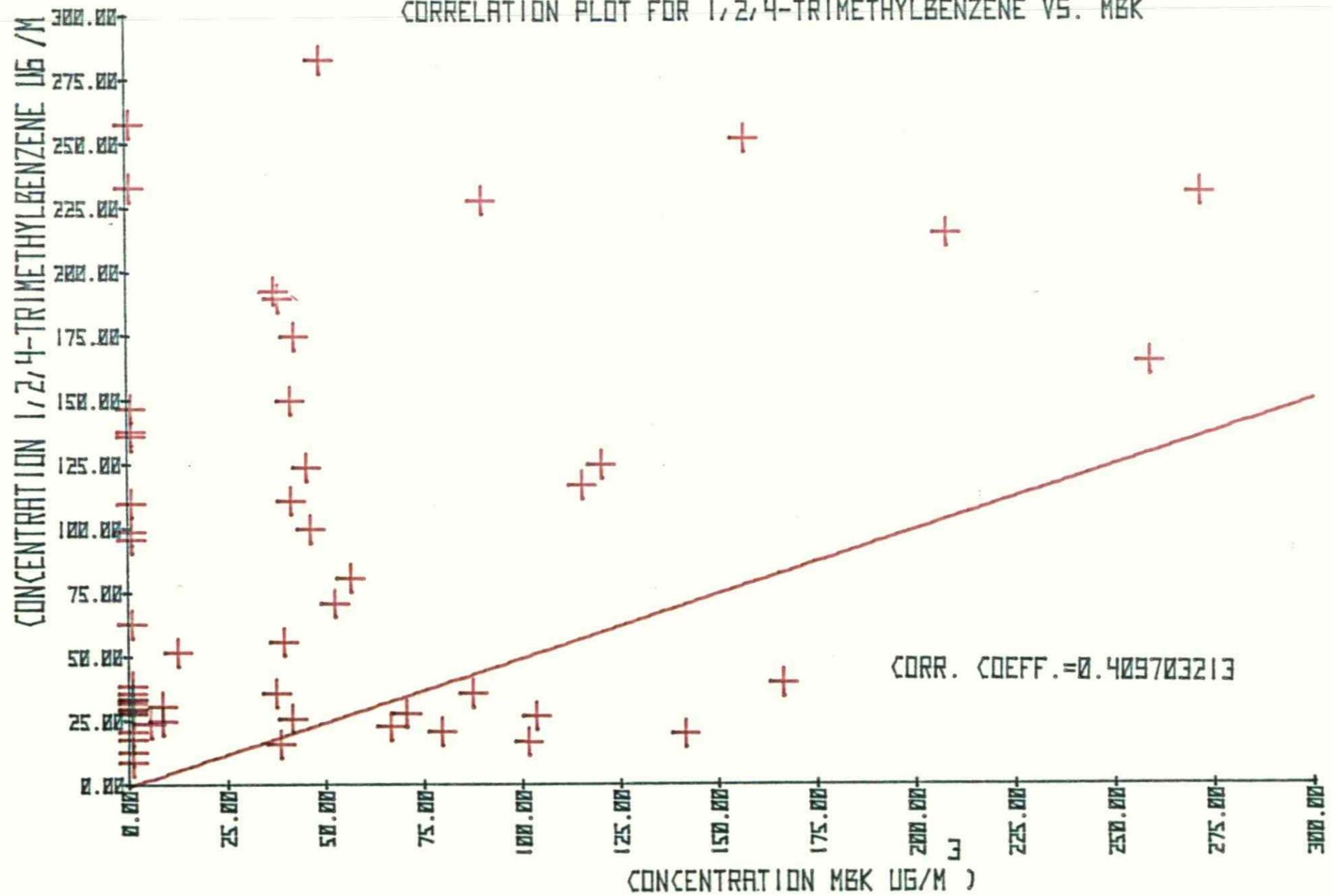
Units - $\mu\text{g}/\text{m}^3$

NB.- Blanks mean not detected

[illegible]

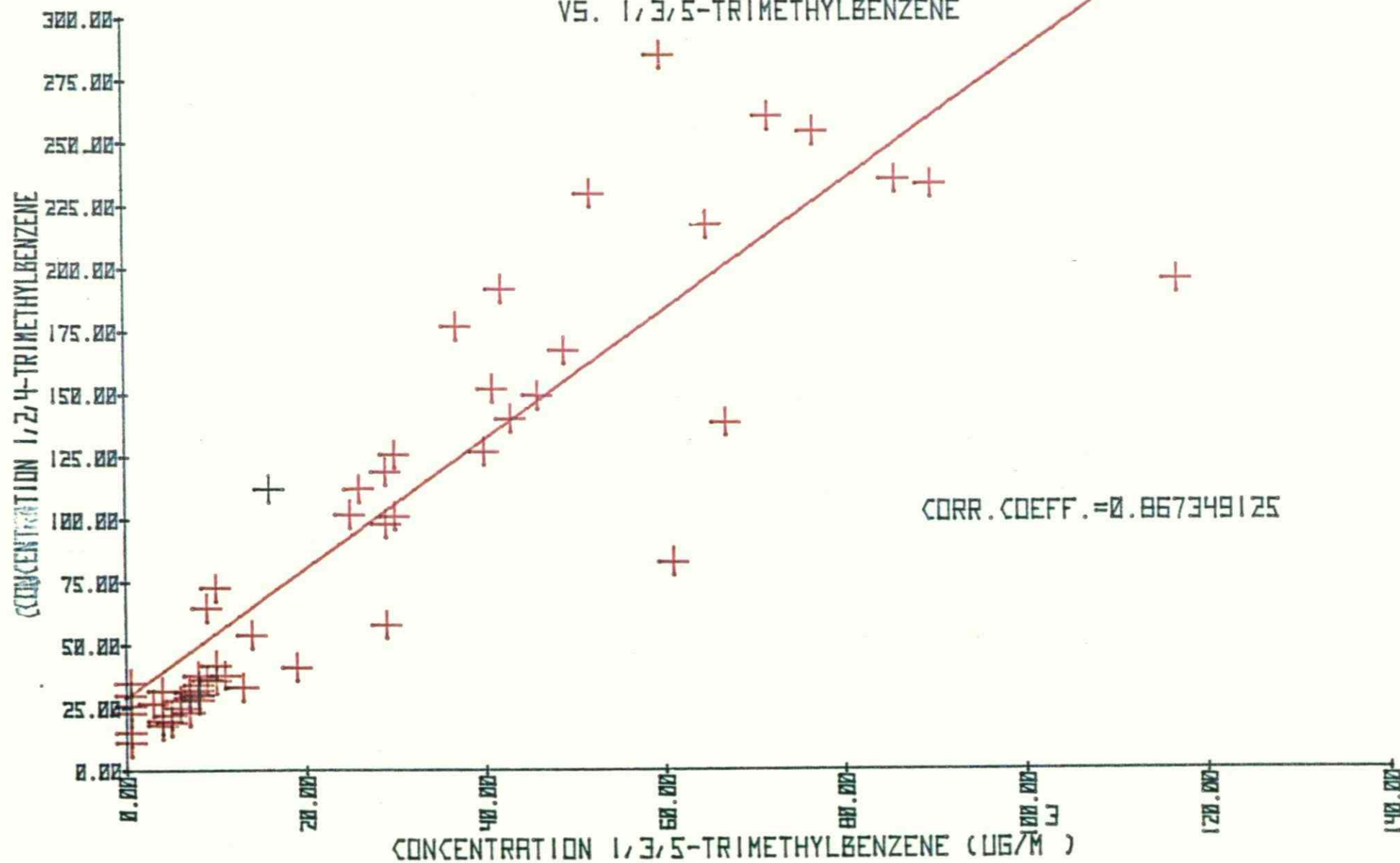


ANCHOR CAP
CORRELATION PLOT FOR 1,2,4-TRIMETHYLBENZENE VS. MBK



ANCHOR CAP

CORRELATION PLOT FOR 1,2,4-TRIMETHYLBENZENE
VS. 1,3,5-TRIMETHYLBENZENE



MOEE
SCI & TECH BRANCH
LIBRARY

TD
883.7
.06
A432
1980

Ambient air survey in the
"junction triangle" area -
Toronto : July - August, 1980.
77803